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Though many members of the staff of the Department have helped in telling this story, the writers must bear the entire responsibility for its historical accuracy.

The Massachusetts Department of Public Health is indebted to the John Hancock Mutual Life Insurance Company for relinquishing the services of Raymond S. Patterson, Ph.D., so that he could collaborate with Mrs. Mary Carr Baker in the preparation of this historical review of the Department's history.

R.S.P.
M.C.B.

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THREE-QUARTERS OF A CENTURY OF PUBLIC HEALTH IN MASSACHUSETTS

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A surveyor pressing on into uncharted regions establishes bench marks as he moves along. These are points set on solid, immovable objects to which he can sight back to give him a base for new observations. By the same token, it is helpful to us, who are charged with the duty of finding new ways to protect the public health, to look back occasionally toward the bench marks established by our predecessors. This seventy-fifth anniversary of the founding of the Massachusetts State Board of Health—the first in America—seems an appropriate time for us to turn for a moment to take our bearings anew.

This taking of our bearings is a wholesome experience. It was Chapin who warned us that those who ignore the past tend to become complacent about the present. He made it clear that what we need is a healthy dissatisfaction with our own work. For public health—like other human endeavors—does not long remain static. Either it rises to new levels of achievement demanded by the social needs of the day, or we find it beginning to sink below the levels established by its predecessors. We, who must anticipate and prepare for new functions and duties which a thriving public health imposes upon us, can best gain the necessary perspective to do our work well by knowing and understanding the past—by seeing as a whole the moving stream of public health administration in which we so briefly play a little part.

In the illustrious records of the first seventy-five years of state public health administration in Massachusetts there will be found many solid, immovable achievements. There are five bench marks toward which we may in turn profitably sight back in order to take our present bearings and possibly to glimpse the future.

BENCH MARK 1869

Beginning the Pioneering Decade

We can only speculate on the precipitating causes that gave to our country the first State Board of Health. It is reasonable to assume that Civil War experience was not without its effect, for diseases caused by insanitary environment and infected wounds killed many more soldiers than did the bullets of the combatants. Recognition of the deficiencies of military sanitation was carried over to civilian life and soon after the war's end we read of public agitation for the creation of a central health agency of some sort. Four years after the War Between the States, the Act of 1869 was passed.

We know that diphtheria had reached a peak at this time. Massachusetts suffered under this scourge along with most of the other populated areas of

the country. Thousands of cases occurred each year and deaths were counted by the hundreds. This could not have been without effect.

Fear of cholera may have played its share. In the Board's first annual report, the Secretary writes: "In 1866, when an epidemic of cholera was feared, the selectmen of Brighton employed Dr. Henry G. Clark of Boston to make a sanitary inspection of the town."

Whipple* credits Dr. Henry Ingersoll Bowditch with the pressure that induced the General Court finally to establish a State Board of Health. At his instigation, the Massachusetts Medical Society twice memorialized the legislature to authorize such a board. A survey of the State's needs was proposed, and later a general health agency was demanded. Through the efforts of politically influential friends, the legislature voted the enabling act—three years later.

Dr. Bowditch himself refers at length in an early paper to the celebrated Chadwick reports which had led to the great sanitary awakening in England. The Chadwick Report a generation earlier undoubtedly had considerable influence in New England.

The second chairman of the Massachusetts State Board of Health, in a candid moment, wrote that the movement had its inception chiefly because of an outbreak of typhoid fever in a girl's school in which the wife of one of the leaders of the legislature was interested.

To a student of the history of public health, our failure to list Lemuel Shattuck's "Report of a General Plan for the Promotion of Public and Personal Health"—the Sanitary Survey of 1850—may seem heretical. We find but slight evidence in the recorded annals of the early days of the State Board of Health that this Report did, in fact, influence the founding of this pioneering venture.*

Whoever, or whatever, may have provided the stimulus for the enactment of the Act of 1869 by the General Court of Massachusetts, the framers of this law showed a surprising grasp of the sanitary needs of the times in the specific obligations which they imposed upon the Board to be created. The law reads in part:

> "The board shall take cognizance of the interests of health and life among the citizens of this Commonwealth. They shall make sanitary investigations and inquiries in respect to the people, the causes of disease, and especially of epidemics, and the sources of mortality and the effects of localities, employments, conditions and circumstances on the public health; and they shall gather such information in respect to those matters as they may deem proper, for diffusion among the people. . . . They shall, in the month of January, make report to the legislature of their doings, investigations and discoveries during the year ending December thirty-first, with such suggestions as to legislative action as they may deem necessary.
>
> "The board shall meet at the state house once in three months, and as much oftener as they may deem expedient. . . .
>
> "It shall be the duty of the board, and they are hereby instructed, to examine into, and report what, in their best judgment, is the effect of the use of intoxicating liquor as a beverage, upon the industry, pros-

* "State Sanitation" by George C. Whipple.

* The Sanitary Survey is such a remarkable State paper that an abstract of its principal recommendations will be found in the first appendix.

perity, happiness, health and lives of the citizens of the state. Also what additional legislation, if any, be necessary in the premises."

Soon after the passage of this law the Governor appointed a board of three physicians and four laymen and instructed the chairman, Dr. Henry I. Bowditch, to call his fellow members together. We have an entertainingly realistic picture of this first meeting. The members gathered in a committee room of the State House, for no other quarters were provided. The address which Dr. Bowditch had prepared has about it a ring of solemnity which suggests that the author was impressed by the historical potentialities of the moment. As this oration is preserved intact in the first annual report and has been widely copied in other histories, only his admonitions to the members, phrased in the florid language of his day, need be recorded here. After reviewing at some length the earlier movement in England, he concluded:

"Let us look for a moment at some of the general objects and duties involved in the Act establishing our Board.

"First. It directs the Board to take cognizance of everything tending to public health, and of course requires us to endeavor to eradicate everything tending to public disease and death.

"Second. It directs us to diffuse among the people a knowledge of the means of obtaining individual and public health and of preventing disease.

"Third. We are ordered to investigate the effects of the use of intoxicating liquors upon the industry, prosperity, happiness, health and lives of the people, and it is intimated that we may suggest legislation on any or all of the subjects committed to us for investigation. . . .

"The law requires us to diffuse among our people any already established laws of public health, and also whatever we may hereafter discover on that subject. I look upon this feature of the law with deep interest, for I believe by it we may do much service to the people.

"How shall we diffuse this knowledge? (a) By lectures from our Secretary or from members of the Board on various special subjects connected with public hygiene—such as ventilating, and building, and location of houses; on various well-known diseases capable of partial or entire prevention on knowledge of causes being given. . . . (c) By the publication in a compact form and the wide circulation of the pitch of our general knowledge on public hygiene. . . . (d) By our annual reports to the legislature, which, I trust, will always be models of brevity and of compact learning. . . .

"In conclusion, gentlemen, let me say that, while I feel alike our grave responsibilities and the dignity conferred on each one of us by His Excellency the Governor in his selection of us for these offices, I have at the same time no misgivings; but on the contrary, the liveliest hope that this Board will faithfully and in an able manner perform its duties, and that thus it will become a real blessing to our State, not only at the present time, but long after every member of it has died. It will assuredly be such if we, the necessary originators of its various details, only look at our duties in the light of the broadest philanthropy and as far as in us lies, the wisest statesmanship, and finally with all the knowledge that modern science can at present give us."

An Inquiring Board Initiates A Variety of Investigations

A week after this inaugural meeting, the Board members reassembled to adopt by-laws, and at this session a half-dozen activities were singled out for investigation by the members—insanitary conditions in slaughter-houses, sale of poisons, an inquiry into sickness and mortality rates in the slums, and a circularization of the local boards of health to advise them of their powers and duties. They proposed to collect and publish the numbers and prevailing causes of death in the larger communities.

Dr. Bowditch's conception of the Board's proper function was that it investigate causes of disease lurking in the air, the earth, and the waters which cover it, and that it give advice to local boards and to the public generally. For many years this able Board was to carry on these varied investigations—some in the realm of sociology, some in environmental sanitation, others in more direct disease control. Those which were to prove most far-reaching in their effect on the national public health were the pioneering studies on the purification of water and sewage. Although the Board had no power to compel action by the cities and towns or the individuals in them, its influence was so great that Massachusetts took the lead in the protection of water supplies and the safe disposal of sewage. The early investigation into the sources of communicable diseases did not achieve brilliant results, for there was as yet but a shaky basis for the nascent epidemiologic science and the energies of the members were forced into other channels whether they wished it or not.

Just as the Board's influence began to be firmly established, and its investigations well under way, someone blessed with unusual foresight and mindful of the historical import of these early pioneering days, seems to have decided that posterity should have a clear picture of the years which were to do so much to mold public health practice in America. While the Secretary of the Board, Dr. Charles F. Folsom, was abroad studying European sanitary engineering procedures, Dr. William Lambert Richardson—long the guiding influence of the Boston Lying-In Hospital—was deputized, as acting secretary, to prepare a summary of the first seven years of the Board's work. It is a brief document, but of absorbing interest to one who is curious about these exploratory years. In this summary is quoted the circular letter which the State Board of Health sent during the first month of its existence to the health boards of the several cities and towns of Massachusetts. After some introductory paragraphs in which Dr. Bowditch voiced the solid convictions of the Board members that public cleanliness is the desired goal if the public health is to be preserved, he wrote:

> "In entering upon our duties, which are rather advisory than executive, we desire to establish such communication with the local boards having this important subject in charge, that all may work together for the common advantage of the people, for the prevention of disease, and for the prolongation of life.
>
> "We believe that all citizens have an inherent right to the enjoyment of pure and uncontaminated air, and water, and soil; that this right should be regarded as belonging to the whole community; and that no one should be allowed to trespass upon it by his carelessness, or his avarice, or even by his ignorance. This right is in a great measure recognized by the State, as appears by the General Statutes.
>
> "If these were strictly and impartially enforced, we should have a con-

dition of public cleanliness, and of public health, which would make Massachusetts a model for all other communities. . . .

"It has been doubted, whether the public mind is sufficiently aware of the dangerous elements around us; whether the connection between filth and disease is as yet proved to the public satisfaction; whether the people are convinced that undrained land is unwholesome to live upon."

After calling attention to certain laws which local health boards were directed to administer, he closes with these stirring admonitions:

"We confidently look to you for the enforcement of these laws.

"We believe that public opinion will fully support you in so doing.

"We will give all the help in our power.

"There is a great work before us, which, if carried out in the letter and spirit of the laws referred to, we cannot doubt will justify the wisdom which framed them.

"In making this our first communication to the boards of health of the various cities and towns of the Commonwealth, we sincerely hope that it may serve as the opening of friendly and helpful relations between us, and that it will lead to reforms the effects of which will be evident in the improved condition of public health."

Board Members Look First to the Purity of Water Supplies

As soon as its investigations were set in motion, the Board employed William Ripley Nichols, a chemist twenty-four years old and a professor at the lusty new Massachusetts Institute of Technology, recently established in the Back Bay, to begin the examination of ponds which furnished the water supplies for a number of cities north of Boston. This talented chemist continued, for nearly a score of years, to contribute to, and guide the sanitary investigations of the State health agency. To him must be accorded the honor of establishing the technology of water chemistry.

The General Court called upon the Board soon after it had settled down to business to look into the matter of stream pollution throughout the State. Of necessity this included an investigation of sewage disposal. Early findings of this survey inspired the Secretary of the Board, Dr. Folsom, to write a lengthy treatise, published in a later annual report and entitled "The Disposal of Sewage." The limitations of the adolescent engineering science of that time are suggested in the following quotations from it:

"Water-supplies necessitate sewers; and sewerage-systems in most countries involve pollution of streams. Offensive as this pollution may be, it is less dangerous to health than retaining filth about our dwellings in vaults and cesspools.

"In Salem, Lynn, Haverhill, Worcester, and Boston, with its adjacent cities, the nuisance from putrefying sewage incompletely removed has become a serious evil. The remedies must be determined in each case by careful especial study by experts. We can only say that the principle should be established that each community should dispose of its own filth without allowing it to be a source of offence to others. In the seaboard cities, some modification of a system of intercepting sewers will probably prove the most ready solution of the difficulty. In inland cities and towns, irrigation would be likely to be successful, and not involve a large annual cost; after some experience, it is very likely that even a profit may be realized from it."

Noses Are Directed Toward Brighton Slaughter-Houses

It must be remembered that the Massachusetts Board began its labors in a day when scientific beliefs were still befogged with Pettenkofer's assumptions that emanations from moist soil could somehow cause typhoid fever. Scientists still believed that offensive smells gave rise to epidemics—"If anything is settled as to the causes of disease it is the influence of decomposing organic matter in giving life to . . . typhoid fever", wrote the Secretary, so it is not surprising that this Board, composed chiefly of Boston members, first turned their attention—and their noses—to the nearby town of Brighton. In this community a half-million animals were butchered and dressed each year in fifty or more small and exceedingly filthy slaughter-houses. Connected with each were piggeries in which hogs wallowed all summer in decomposing offal, and as a result, there was within a few miles of the center of the crowded metropolitan area an unspeakable nuisance which might at any time—the Board was convinced—become a menace to the health of the inhabitants of Boston. In other nearby cities there were rendering establishments which caused "the air in the immediate neighborhood and oftentimes for miles around to be contaminated with the foul odors and vapors escaping from the vats and improperly constructed chimneys."

The Board members called for an immediate abatement of this nuisance and to this end they proposed an act to finance the construction of central abattoirs. "The plan proposed met, as was perhaps natural," reports the disillusioned Secretary, "with an almost unanimous opposition from the Brighton butchers who regarded the whole scheme as visionary and impractical." The Board persisted, however, and lived to see its efforts crowned not only with the building of the once unanimously opposed central abattoirs, but by the enactment of a law concerning slaughter houses and noxious and offensive trades. This act prohibited the building of slaughtering or rendering establishments without official permission and gave the Board authority to order any person engaged in such business to cease and desist. So we find the Board, which only two years before had been created solely to advise and suggest, given the power to enforce compliance with at least one order.

The Chairman Envisages the Health Menace of the Slums

Something of the breadth of the interests of this trail-blazing Board is indicated by the variety of its concerns. Early attention was turned to the sanitary condition of the homes of the poor. The Chairman of the Board visited London and while there made it a point to see the sprawling city's worst slums, of which he gives us a graphic account. Too, he looked into the maiden effort of certain of the public spirited British gentry to provide minimal decencies in the housing for the London poor. Returning home, inspired by this evidence of an awakening social conscience, the Chairman and the Secretary, accompanied by well-armed police, visited the slums of Boston. Here they found degradation and filth worse than any that existed in London. The obvious danger of serious outbreaks of diseases in the crowded, filthy slums, caused the Board to address a letter to the aldermen of the city, who were by law made responsible for health, calling attention to the statutes relating to tenements, which were daily so flagrantly violated. Nothing daunted by the masterly inattention paid to this communication, the Board began an effort to awaken public interest, hoping to show that adding to the health and physical

well-being of the poor "would also greatly contribute to the material prosperity of the rich, by furnishing a sure return for the money which might be invested in the sanitary improvements so much needed." This promising financial opportunity seems to have tempted no great number of investors.

"Two difficulties were encountered," writes the Board's reporter. "In the first place, there was found to exist an utter indifference to the subject in the public mind; and in the second place, all health matters were, according to the existing local laws, in the hands of politicians, whose tenure of office was so precarious that they were unwilling to inaugurate any movement which, owing to ignorance or prejudice, would naturally meet with more or less opposition." Nothing seems to have come of this attempt to find a way to decent housing but the Board, through its efforts, did succeed in arousing public opinion to a point which demanded the passage of an ordinance fixing responsibility and granting necessary powers to the city board of health.

Demon Rum Does Not Escape Board's Roving Curiosity

Parallel with these eminently practical efforts looking toward the improvement of the health and well-being of the public were others which seem today less worthy of the Board's talents. To its correspondents throughout the State and, in fact, to many of the American Ministers at foreign courts and to Consuls in the principal ports of the globe, the Board mailed questionnaires about the use of intoxicating liquors and how far the abuse of alcohol was productive of crime. From the two hundred and more replies received, an analysis was undertaken "of the most valuable information bearing on the subject under investigation." From this analysis the Chairman, Dr. Bowditch, came to the unique but firm conclusion "that intemperance was really governed by a cosmic law." Space does not permit a review of the reasoning by which he reached this strange conclusion or an elucidation of its theory—it is enough to record that it seemed both to satisfy the members and to fulfill the demands of the Act creating the Board. One tangible result of these investigations was a proposal that the State establish inebriate asylums in various parts of the Commonwealth, but this appeal came to nothing.

In another report, the attention of the public was called by the Secretary to the hygienic hazards which the erection of dams might produce in their immediate neighborhood. A careful examination of the opinions of many observers convinced the Board that the raising of the level of stream waters was unquestionably prejudicial to health, for epidemics, consumption, and malarial fevers were alleged to be especially prevalent near such places. So Professor Nichols, busy with his water and sewage studies—research which was destined to benefit the sanitary practice of the country—was sent on a wild goose chase to examine ground air to find out, if he could, what baneful and noxious miasma lurked there.

Consumption Investigated Without Benefit of Koch

"About one-fifth of all who die in Massachusetts fall victims to consumption," so wrote the Secretary of the Board in his commentary on a concerted attack on this public health problem inagurated by Dr. Bowditch, himself a specialist in the field of tuberculosis. The first step was to issue a circular letter to the local correspondents throughout the State whom the Board had asked to be appointed by the officials of each town and city. In addition, other members of the medical profession who might throw some light on the

subject were addressed. A careful tabulation of the replies led Dr. Bowditch to the assumption that tuberculosis is influenced by hereditary tendencies. The effect of drunkenness of parents on consumption in their offspring is not strongly marked, he argued, but the effect of drunkenness in the individual is. Consumption is favored by overwork, by certain trades and by mental trouble. Of the 210 correspondents, only 100 held the disease to be contagious, but 168 believed it to be caused by a wet location, thereby strongly reinforcing the theory held by Dr. Bowditch himself. Thus, by the democratic process of weighing preponderance of opinion, did the Board fortify its beliefs about the cause of consumption. It is small wonder then that when a few years later, certain communicable diseases were declared dangerous to the public health, tuberculosis was not to be found among them.

Throughout this decade of pioneering, there was a steady growth in the number of public water supplies. In 1869, when the Board came into existence, there were only seventeen cities which piped running water to most of the households of the community. At the close of the decade sixty-eight cities provided such facilities. It is to be noted that despite this increase, the neighborhood pump was still the principal supply of domestic water and the outdoor privy the chief means of the disposal of wastes.

BENCH MARK 1879

The Six Years of Doldrums Commence

After a solid decade of productive pioneering the progress of the Board came abruptly to a halt. The cause of the unfortunate interference with the public's health is given in Dr. Bowditch's angry explanation for his resignation from the Board. He wrote:

> "In 1878 came mutterings of political disaster to the ruling powers, and forebodings of what the renowned General Butler would do with the numerous 'commissions' (that of health among them) that were 'spending wastefully the people's money.' Accordingly, to attack this redoubtable General upon his political 'flank', the legislature, under suggestions from Governor Talbert, merged the three departments of Health, Lunacy, and Charity, a Cerebrus (sic.), in fact, in its grotesqueness of head. Three commissions, all different in ideas and modes of action, jumbled into one heterogeneous mass, simply because the ruling party feared the advent of power of a political adventurer! The prospects were chilling in the extreme to me, and I soon found two sad results; viz., heartburnings and jealousies among the increased number of members, and an almost total neglect of sanitary work. At one time, for three or four successive meetings, nothing was done about sanitation, the time being occupied in discussions on lunacy and charity, on both of which subjects, so far as they had relation to the State, neither I nor my comrades on the old board knew anything. Such neglect of that which we had been for years laboring for was distressing. I appealed in vain for a return to the single board. Political demagogism was rampant, and our efforts were fruitless; and finally, as a solemn protest against the absurd and fatal combination, I resigned, after months of fruitless effort to persuade a change."

So health administration in Massachusetts lost the benefit of the guidance of a courageous gentleman, a physician soundly based in the medical sciences

of his day, broad in his scientific interests and endowed with an essential curiosity. Whether or not fear of political consequences inspired this weird conjunction of health with lunacy and charity, it was soon to be evident that the union was a hopeless one.

Enter the Sanitary Statesman—Henry Pickering Walcott

Massachusetts was perhaps luckier than it deserved to be for so wantonly losing the services of the dynamic Bowditch. It was saved from its folly by the chance enlistment of another able sanitarian, Henry Pickering Walcott, who came into the Board's service first as medical health officer of the sub-committee on health. Later he was to become chairman of that sub-committee. Dr. Walcott was a man of many parts—an educated gentleman, a well-trained physician and an outstanding administrator skilled in the several sciences which, with medicine, go to make up public hygiene. In addition to his contributions to health work in the Commonwealth, he was a hospital board chairman, a member of the Corporation of Harvard University, twice acting as temporary president, chairman of the Metropolitan Water Board and the recipient of honors so many and so varied that they may not even be enumerated here.

Because the administrative activities of the overshadowed sub-committee on Public Health of the combined State Board of Health, Lunacy and Charity seemed to wallow listlessly in the doldrums, it does not mean that this was a period lacking any sanitary progress. Indeed, this was a time of marked advance in the creation of municipal water systems. Studies in stream pollution, water purification and sewage treatment which were carried on by the engineers of the State Board's Division of Sanitary Engineering, have become classics in the realm of sanitary science. Incidentally, the creation of this Division of Sanitary Engineering in 1886 was the first instance of formal and functional organization of the Board's work. The Division—oldest of all, and about to celebrate its sixtieth anniversary—has had but two heads since 1895, the able engineers Goodnough and Weston. That is such an unusual record that we cannot forego mentioning it here.

The General Court enacted a law requiring local water boards to furnish data about their community supplies to the newly created Sanitary Engineering Division which annually sent out a questionnaire relating to such practical matters as the source of supply and the quantity of the water consumed. A drainage commission was appointed to plan a metropolitan sewerage project, to apportion its cost, and finally to administer it. The report of this commission is another of the great engineering papers for which the early Massachusetts pioneers are justly entitled to fame. For this report, Dr. Walcott wrote the inspired concluding paragraph:

> "Precisely the same principle which enjoins a watchful care over the exterior waters of the State would seem to call for at least an equal solicitude concerning the abuse of its interior waters. But mindful of the tenderness with which Massachusetts has always treated the industrial classes, we think it would be wise to embrace in the enactment one peculiarly characteristic feature borrowed from the act establishing a railroad commission, and which has proved strong enough to

> enforce amply all the rights of the public in that class of highways called railroads. . . . In a word, it shall be their especial function to guard the public interest and the public health in its relation with water, whether pure or defiled, with the ultimate hope, which must never be abandoned, that sooner or later ways may be found to redeem and preserve all the waters of the State."

During the time of the Board's eclipse, a Food and Drug Act was passed, the second oldest in the United States. In those days nearly every article of food that entered commerce was adulterated in one form or another. Flour was often of inferior quality and even contained dirt. For butter, oleomargarine was frequently substituted. Canned food was preserved with chemicals. Ground coffee was combined with chicory, nut shells and burnt sugar. The list was endless: the variety of adulterants a monument to man's cupidity and carelessness. To put a stop, both to outrageous adulteration and to accidental contamination, four chemists and two inspectors were set to the Herculean task of enforcing the new law. The activity of these men resulted, very soon, in reducing the most frequent of the violations and the worst of the gross carelessness.

During the doldrums, the members of the health sub-committee and the staff all did what they could to mitigate the outbreaks of the various diseases that occurred. Of historical interest is the account of an investigation of an epidemic of malaria in Framingham. Here the relationship of this disease to standing water was discussed, although the agency of the Anopheles mosquito in transmitting the plasmodium was not suspected. The legislature, again "mindful of the tenderness with which Massachusetts has always treated the industrial classes"—in Walcott's words—enacted another law requiring local health boards to notify the State agency of cases of smallpox. Later diphtheria was added, and one by one scarlet fever, measles, typhoid fever listed as diseases dangerous to the public health.

Little by little, the idea of the germ causation of communicable disease was beginning to take hold of the minds of Board members. Dr. Samuel W. Abbott, who succeeded Walcott as health officer of the health sub-committee, made a search of the old case records of cholera in Boston and in connection with it, mentioned Koch's bacteriological discoveries. This is the first public record of the Board's comprehension that germs might be the cause of communicable diseases.

Talbot, the Governor pilloried by Bowditch in his letter of resignation and the signer of the law joining health with lunacy and charity, later accepted the chairmanship of the triple-functioned Board. He paid handsomely for his alleged political timidity, since the Board was continuously under fire, and soon he had his fill of badgering. He resigned and within a year the separation of these agencies took place.

Throughout this period, Walcott had risen in stature. He was in the later forties at this time and in the prime of his influence and understanding. He was ready to take over the reins of the Board when it was released from its combination with lunacy and charity and to give it a singleness of purpose so that productive leadership might achieve far-reaching results.

BENCH MARK 1886

Signalling "the Golden Age" of Sanitation

The eventful eighties were stirring times. The Brooklyn Bridge—one of the world's wonders—was opened to traffic; a German professor announced the discovery of the tuberculosis germ; the first electric streetcar ran in a city street; Klebs saw the diptheria bacillus; Finlay pointed an accusing finger at the mosquito as a carrier of yellow fever; Trudeau went into the Adirondack wilderness to be cured of tuberculosis and there he built "Little Red."

Sewage Experiment Station At Lawrence Earns High Honors

In the eighties, Massachusetts, through its rejuvenated Board of Health was to make one of its greatest contributions to sanitary science—this contribution was the product of the fertile brains of men newly appointed to the staff of the Lawrence Experiment Station.* The station itself was a crude shack of rough lumber, certainly unimposing in appearance, but from it flowed achievements truly impressive. As Whipple says, "The results of its researches have probably been as valuable as the results of all other American sewage experiment stations put together." The establishment of this productive venture must be credited to Hiram Francis Mills, C.E., a member of the Board, who conceived the idea of experiments on the treatment of water and sewage and proceeded to put them into execution. For thirty long years he gave unstintingly to the progress of this work, always without remuneration. His friendship for, and collaboration with, Henry Pickering Walcott throughout all the full years of their association will long prove an inspiration to those of us who hold that man's greatest satisfaction springs from efforts to improve the lot of the race and that in public health there lies an unparalleled opportunity for such service.

Tribute must also be paid to all the pioneering staff of this Station, who, working under the guidance of Mr. Mills and inspired by him, did great things. Because of their zeal and vision, giant strides were made in our knowledge of sewage disposal. Mr. Mills used to say that his greatest discovery was Allen Hazen. Almost a stripling, he was given charge of the Experiment Station in 1886 and, in later years, he became known as one of the outstanding sanitary engineers of his day. The same is true of George W. Fuller, who joined Hazen's staff as a bacteriologist and later succeeded him in charge of the Station. The list of others who were associated from time to time in this work reads like "Who's Who in Science," for, working at the Lawrence Station or in the related chemistry laboratories set up at Massachusetts Institute of Technology, were Dr. Thomas M. Drown, consulting chemist, Professor William T. Sedgwick, consulting biologist, Edwin O. Jordan, bacteriologist, and Harry W. Clark, chemist, who succeeded to Fuller's post and continued in charge of the Station until his retirement.

Not only did the young Professor Sedgwick contribute mightily to the findings of the Lawrence Experiment Station, but in other ways he added materially to the scientific accomplishments of the State Board of Health. He made a revealing investigation of the conditions of market milk in Boston and

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* A chronological list of the beginnings of the chief activities of the Board, and the Department will be found in Appendix II. We believe that this account will be found more readable if it is not encumbered with a superabundance of historical dates.

as a part of this survey, he carried out the first bacteriologic examination of a municipal milk supply ever made in the United States. His studies of typhoid fever broke new ground in developing the epidemiologic method of disease control.

Drainage Commission Recommends Oversight of All Inland Waters

As a result of the independent investigations of the Massachusetts Drainage Commission, a law was enacted giving to the State Board of Health general oversight of inland waters. It was instructed to consult with and advise the officials of municipalities and firms concerning proposed systems of water supply and sewerage. The law decreed that this advice should include recommendations for appropriate sources and methods of assuring the purity of potable water and the best methods of disposing of drainage and sewage. Although this legislation made it mandatory to consult with cities and corporations engaged in manufacturing which might give rise to the pollution of inland waters, the Board was given no power to compel action. Despite this lack of real authority—or punitive measures of any kind—the Board's influence on sanitary improvement of the State was enormous. The newly created Division of Sanitary Engineering published exhaustive reports on the science and mechanics of water purification and sewage treatment—reports which today are classical and which for many years were considered textbooks on matters of water supply and sewage disposal.

The Massachusetts Board of Health was to make another series of outstanding contributions to America's public health administration. These were in the realm of the infant science of bacteriology and were to come from a venture in practical preventive medicine, a biological manufacturing laboratory initiated jointly by the Board and Harvard University. Since its beginning, the Massachusetts Antitoxin and Vaccine Laboratory has played a continuous and often highly significant role in the history of the production of prophylactic and therapeutic products for the free use of the citizens of the Commonwealth.

Rapid scientific advances in the prevention of communicable diseases created administrative problems which the State Board determined to surmount so that the resultant knowledge could be put to practical life-saving use. Although the value of smallpox vaccine had been established for nearly 100 years, the practical job of making a reliable vaccine readily available at all times was yet far from solved when the Board recommended the establishment of a State vaccine institution. There were, it is true, numerous sources of vaccine lymph but the quality of the vaccine fluctuated greatly so that there were many failures in creating satisfactory immunity, and a considerable number of untoward reactions. More than thirty years earlier, the farsighted General Court had made vaccination a prerequisite to school attendance, so the Board felt that it had an obligation to provide a dependable vaccine in available quantities. For some years, the recommendation of the Board fell on deaf ears.

Walcott's Vision of a Laboratory Is Fulfilled

However, when Behring and Kitasato discovered that injection of animals with the toxin of the diphtheria bacillus would produce in the animal's blood serum an antitoxin having remarkable curative powers for diphtheria—this knowledge called for action. Diphtheria at that time was a disease of widespread prevalence and tragically high mortality, and for it no effective cure had been discovered.

Reports from Europe, and observations following use of the small quantities of antitoxin available in this country, indicated that immediate and dramatic benefits followed administration of antitoxin even to extremely ill patients. Antitoxin was scarce in America, however, and that which was obtainable from Europe varied considerably in quality. The existence of such a remedy and the difficulties in the way of its general application confronted the State Board of Health with an immediate need for action which could not be ignored. Under the forthright leadership of Dr. Walcott, the Board therefore undertook the production of diphtheria antitoxin in 1894. The City of Boston also began serum production at this time, but discontinued it about four years later.

The production of antitoxic serum was begun at the stable of the Bussey Institute in Forest Hills, and the serum was processed at a laboratory in the Board's offices at the State House. The first serum was distributed in March 1895. At about that time it became apparent that the nature and scope of the work required the direction of a trained bacteriologist. The Board of Health—thanks to Walcott's directness and foresight—obtained the services of Dr. Theobald Smith, who was already one of the outstanding bacteriologists of that time. Dr. Smith left a position in Washington as Director of the Division of Pathology, Bureau of Animal Industry, to become Pathologist to the Board. At the same time he was enabled to continue his distinguished researches through his appointment to the Professorship of Comparative Pathology at Harvard Medical School—a position established for this purpose through the generosity of Mr. George F. Fabyan of Boston.

Laboratory Prospers Under Theobald Smith's Administration

The acceptance of diphtheria antitoxin by the medical profession was rapid, and production expanded from the first year's output of 1700 doses to over 33,000 four years later. The clinical results achieved with antitoxin were indeed remarkable. A Dr. Mason, writing in that year, noted, "The change in the appearance of diphtheria wards since the introduction of antitoxin has been very marked. In making a visit one cannot help being struck with the bright and cheerful appearance of the children." The case fatality rate in diphtheria fell from a general average of 25% before antitoxin to an average of about 11% in treated cases during the very first years of its use. An involuntary experiment which demonstrated the value of antitoxin occurred when "In consequence of an interruption of the use of antitoxin at a well-known hospital, due to a failure of the supply, for a period of a few weeks the mortality among the diphtheria patients immediately rose again to its former height." In 1901 Dr. Smith came to the conclusion that during the first seven years in which antitoxin had been generally available, about 10,000 lives had been saved by its use. During the last two years of this period, the antitoxin distributed was produced at a cost of $14,000, whereas its purchase from outside sources would have cost at that time about $140,000. A questionnaire revealed that from 25% to 90% of the treated patients in various communities would not have received antitoxin if it had not been available free of charge.

The staff of Dr. Smith's laboratory at that time has been pictured by Dr. Reagh, who began work with Dr. Smith on September 19, 1900. In the annals of vaccine production, Dr. Reagh's record must be high for he celebrated the beginning of his 45th year of service by inoculating his 1152nd calf. He recalls that the personnel at the Forest Hills Laboratory in the early days comprised:

Dr. Smith, Director; Mr. E. L. Walker, Bacteriologist; Dr. J. R. Stewart, Veterinarian in charge of the stable; with Mr. Nahum Mitchell and Mr. Julian Horne as assistants. Miss Adams, assisted by Miss Mahoney did the laboratory work and kept records of the antitoxin production supervised by Dr. Smith. Last and largest came Doonan, the "diener", who cared for guinea pigs and attended to the janitor's work.

During this early period Dr. Smith worked steadily at the problem of producing a higher grade antitoxin, and he and his associates carried out innumerable studies to this end. In the annual report for 1896 appears an account of an extensive investigation into the toxin-producing capacities of various strains of diphtheria bacillus.* The success of these studies may be measured in part by the rise in the average potency of the serum distributed, from 100 units per cubic centimeter in 1896 to 425 units in 1900.

Largely as a result of the successful experience with antitoxin, the General Court authorized the Board to produce and distribute vaccine lymph as well. Such an undertaking was out of the question at the already overcrowded quarters in the Bussey Institute. Harvard University therefore made available some adjacent land and, through the munificence of a friend of the University, erected a two-story building designed especially for the work of the laboratory, and the production of smallpox vaccine was begun in this building.

The following year, in a report on "The New Antitoxin and Vaccine Laboratory," Dr. Smith reviewed the history of the institution, pointing out the wisdom of the decision of the Board in initiating this work eleven years previously. He showed that the State's provision of free antitoxin to all, had greatly reduced the mortality from diphtheria; and furthermore that there had resulted from this policy a steady rise in the amount used per case both in Massachusetts and elsewhere. "This influence," he wrote, "has been salutary, for it has been shown that the doses used in the earlier years of antitoxin production were too low." Anent the duty of the State to provide smallpox vaccine, particularly where vaccination is compulsory he wrote, "In European countries this duty is today generally recognized and assumed by public authority. In our country scarcely a beginning has been made. Massachusetts is as yet the only State which has taken up this task; others will certainly follow, for the production of animal vaccine by the State is a logical necessity. Furthermore, it is the only way to bring the physician who performs the vaccination in close touch with the producing laboratory."

A Tribute to Theobald Smith, The Man

Great as were the contributions of the Antitoxin and Vaccine Laboratory, the ultimate value to the world of Theobald Smith's other scientific activities during his period of service to the Board was even greater. He made extensive studies of malaria in Massachusetts, in which he explored the theory that the disease was transmitted by a mosquito and that human beings, especially foreign workmen, were the carriers. His work on human and bovine tuberculosis was continued throughout his years in the Commonwealth and he found time to study anthrax, glanders, and poliomyelitis, among other diseases. Theobald Smith was not only a national but an international authority

* "A Comparative Study of the Toxin Production of Diphtheria Bacilli," by T. Smith and E. L. Walker.

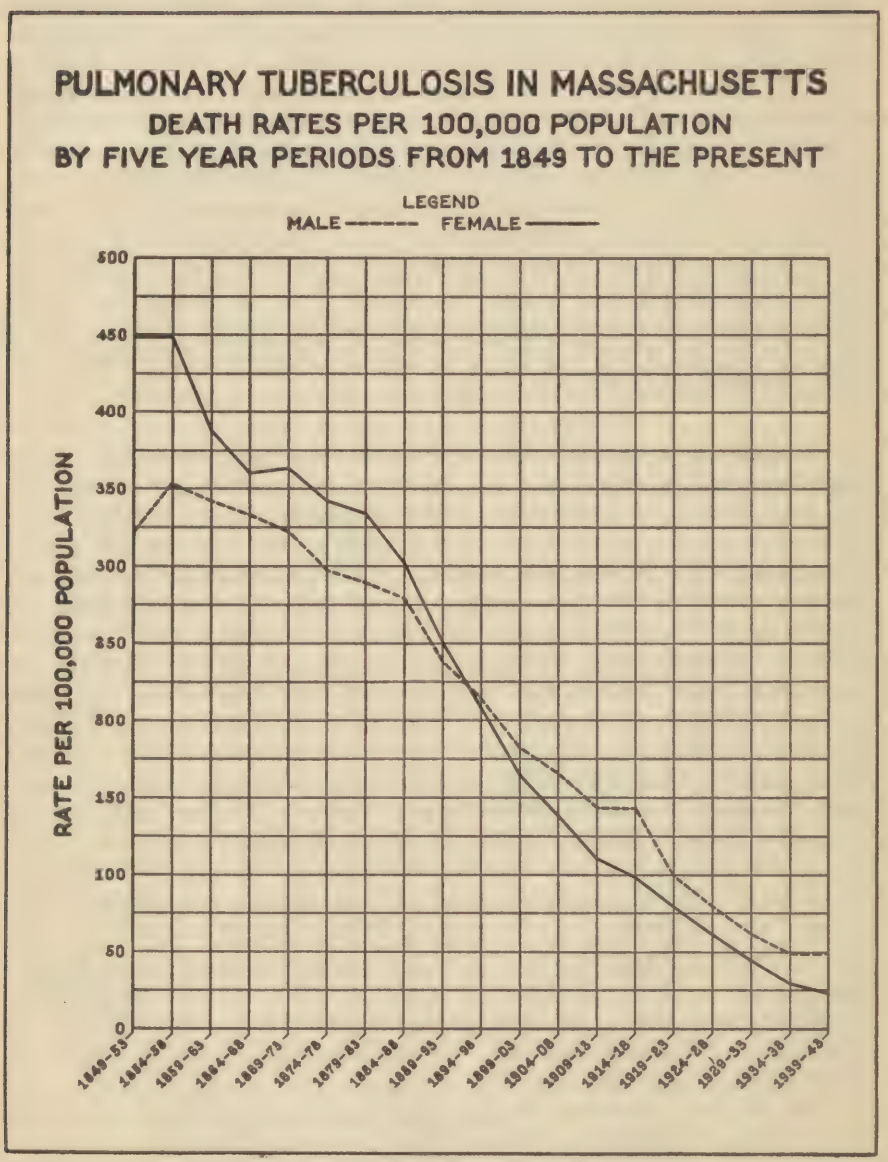
as well, and the Commonwealth of Massachusetts proudly acknowledges its great debt to him.

This story would not be complete without some indication of the tremendous effect which Dr. Smith's personality, character and intellect had upon the formation and growth of the laboratory. Distinguished by the possession of one of the most remarkable scientific minds of his age, Dr. Smith was also endowed with an integrity which was as quick to insist upon scientific accuracy, as it was to command personal loyalty and quality of performance. Many of the stories about him which still circulate at the laboratory portray his scorn for intellectual or physical laziness; for he could tear the cover from weakness in character with a taciturn wit that left the recipient demolished of argument but wiser in mind and spirit. It is largely due to the standards set by Dr. Smith that the laboratory owes many of the characteristics which it retains today. One cannot at this point overlook Smith's frugality, which was of truly anecdotal quality. It is said that his discovery of anaphylaxis was a consequence of his policy of using the same guinea pigs repeatedly for antitoxin testing. The often told story that he would borrow a calf from a neighboring farm, vaccinate it, harvest the vaccine and return the calf reflects not so much his frugality as it does the strangely lax production methods of the time.

A "Small Shack at Sharon" Points The Way to Nearby Care of Tuberculosis

Not all the Board's successes were achieved in engineering research and the biological laboratory; scientific advances that were to change the face of public health administration were made in the field as well as in the laboratory. The way was shown to local sanatorium treatment for tuberculous patients by Dr. Vincent Y. Bowditch, son of the illustrious first chairman of the State Board of Health. Medical opinion during the early years of the era was colored by the teaching of Trudeau who believed that it was the clear mountain air which was the essential element in his successful treatment of tuberculosis at "Little Red," his pioneering venture in the Adirondacks. As a consequence, the Southern Appalachians, Colorado and California had become centers of tuberculosis sanatoria. Realizing the inability of any large proportion of Massachusetts patients to travel to these distant places, the younger Dr. Bowditch determined to test the possibility of treating tuberculosis near the towns where people lived. His "small shack at Sharon," which he himself built, was the first sea-level sanatorium and in it he demonstrated the far-reaching findings that success in every way comparable with those achieved at inaccessible sanatoria and at high altitudes were possible at home. On the basis of these results, Bowditch and his contemporaries were able to convince the State legislature of the advisability of establishing in the Commonwealth a State sanatorium for the treatment of patients with incipient tuberculosis.

This sanatorium for tuberculosis—the first State institution of its kind in America—was established at Rutland. The new hospital, laboring under the handicap of the name "The Massachusetts Hospital for Consumptive and Tubercular Patients," not only brought sanatorium treatment to the people but it was the first to provide at public expense treatment for individuals unable to pay for their own care. For patients unable to pay even a nominal rate, treatment at the expense of the town of their residence was provided. These


PULMONARY TUBERCULOSIS IN MASSACHUSETTS
DEATH RATES PER 100,000 POPULATION
BY FIVE YEAR PERIODS FROM 1849 TO THE PRESENT
LEGEND
MALE ------ FEMALE ——
RATE PER 100,000 POPULATION
500
450
400
350
300
250
200
150
100
50
0
1849-53
1854-58
1859-63
1864-68
1869-73
1874-78
1879-83
1884-88
1889-93
1894-98
1899-03
1904-08
1909-13
1914-18
1919-23
1924-28
1929-33
1934-38
1939-43

two principles—nearby, and free, care—unquestionably laid the foundation for the development of the sanatorium movement in this country.

Following the establishment of the Rutland State Sanatorium, clamor for hospital care was so widely voiced that a legislative commission was appointed to investigate measures for the further relief of "consumptives." The outcome of this survey was the establishment of three additional State sanatoria for tuberculous patients. But provision of treatment centers was not enough, community control was called for and we shall learn later how the Board proposed to meet the need.

Before the nineteenth century came to a close, the seeds of still other outstanding pioneering ventures were sown. The need for some public agency looking to the amelioration of cancer was first noted and recorded. The Massachusetts Board reviewed the records of cancer increase over a period of 30-40 years, and this preliminary ground work was followed by the famous Whitney report—a statistical study analyzing the alleged increase in cancer throughout the Commonwealth. At the same time, Harvard University appointed a Cancer Commission which began immediately to play a part in the explorations that were to lead to cancer control in Massachusetts. Progress toward the solution of the cancer problem in this State has continued without interruption from this period.

A Medical Officer Is Appointed To Deal With Local Health

As demands on the State Board of Health became pressing and more numerous and as problems needing study multiplied, it became apparent that permanent employees other than food analysts, sanitary engineers and bacteriologists were needed. As a consequence, the first permanent fulltime medical employee of the Board was added to the staff. The Board's reasoning which prompted this step can be learned from the annual report of 1898, "For the purpose, therefore, of facilitating investigations of sanitary questions in cities and towns and of aiding the work of local health workers, the State Board has organized a new Department of Health of towns and of correspondents with local boards of health, and has appointed Dr. F. L. Morse as its medical and sanitary inspector." Since Dr. Morse's day there has always been a permanent medical personnel to collect information, investigate outbreaks and formulate recommendations.

Nothing in the annual report of the first year of the new century suggests that Walcott and his associates on the Board looked back on an impressive record of pioneering in this "golden age" of sanitation with warranted, and human, pride in accomplishment. But, at this distance, one cannot dismiss their activities without according praise to Walcott and Mills and their contemporaries, who in the final reckoning were responsible for the inspired undertakings of those fruitful years.

Twentieth Century Opens Fruitfully If Unsuspectacularly

The first half of this Board's tenure of office had ended with the close of the century. It may be characterized as a period of great engineering progress and of achievement in the laboratory and in the field. The second half was to prove to be a time for systematizing and organizing. Though this second decade may hold less of historic interest for us, the work which continued until the next reorganization of the Board was of immense effect through-

out the Commonwealth. During the first decade of the new century one pioneering venture was the appointment of district inspectors, for this was the first attempt in the United States to localize health adminstration. There were also a number of improvements in the previously established services of the State Health Board which must be recorded.

In the Antitoxin and Vaccine Laboratory the final years of Dr. Smith's directorship were marked by consolidation of and improvement in laboratory techniques and by the assumption of certain new duties. The preparation of silver nitrate for the prevention of opthalmia neonatorum was undertaken. The production of anti-meningococcic serum was begun following the demonstration by Flexner of its therapeutic efficacy. Typhoid vaccine production was taken over from Dr. Spooner of the Harvard Medical School. This, incidentally, represented the first of many collaborations by the Antitoxin and Vaccine Laboratory with nearby academic institutions in making new or untried products available and in improving established biologic products.

As was hinted at the close of the discussion of tuberculosis sanatoria, the need for community control of tuberculosis had long been recognized. Now the Board was in a position to play its part in stimulating the extension of local services, for the legislature had enacted a law creating fifteen health districts, each to be under the supervision of a physician known as the State inspector of health. One of the chief duties of these district representatives of the Board was to inform himself concerning the prevalence of tuberculosis within his area. The State bacteriologic laboratory, which had been in existence more than ten years, was called upon to make examinations of sputa and other material for the tubercle bacillus at the request of practicing physicians throughout the State. Because the great majority of tuberculous patients were coming to the sanatoria in an advanced stage of the disease, the legislature passed the so-called dispensary act requiring every city of more than ten thousand population to establish and maintain a dispensary for the discovery, treatment, and supervision of needy persons with tuberculosis.

Fewer Milk-Borne Epidemics

Despite these stirring advances, numerous outbreaks of typhoid fever ascribed to water and milk supplies continued to occur throughout the early part of the first quarter-century. But when local supervision of these public health hazards was undertaken by the cities and towns, water and milk-borne epidemics became rarer year by year. Emergency pasteurizations of market milk protected the public from doubtful milk supplies during epidemic periods. Begun in this way as an emergency protective measure against typhoid fever, pasteurization by demonstrating its efficacy, soon became a standard procedure for all municipal milk supplies. Meanwhile, the diagnosis of typhoid fever was placed upon a much sounder basis. The Widal test was made available throughout the State by the Board's laboratories. Tests of cultures from blood, feces, and urine were added later.

The most frequent type of milk-borne disease came to light with the discovery that epidemics of sore throat frequently were transmitted by milk. As a consequence, the Board's field personnel devoted much of its time to the encouragement of the use of safeguarded milk and this, in turn, stimulated the protection of commercial pasteurizing methods. Common sense frequently came to the aid of official pressure, for after each new epidemic many persons who had

learned by tragic experience that raw milk supplies are dangerous, turned to the use of pasteurized milk.

Systematic dairy farm inspection was undertaken and the deplorable sanitary conditions found in some of the farms induced the Board to urge the passage of legislation obligating local boards of health to undertake dairy inspection.

Insanitary practices surrounding the slaughtering of food animals, a subject which the first State Board of Health attacked courageously and effectively, still continued to plague the third Board forty years later, although a succession of laws had been passed governing the inspection and supervision of abattoirs. An investigation of current conditions revealed more than a hundred slaughtering places doing their grisly business without a sign of worthwhile inspection. Men lacking any qualifications were using the stamp of approval, becoming accomodating "stampers," instead of inspectors appointed to discover and correct insanitary conditions. The general picture was not only one of abattoirs in disgraceful insanitary condition but one which revealed that diseased and contaminated food was reaching the public markets. The legislature, acting promptly and wisely in the public interest, transferred the supervisory powers over slaughtering inspection from local boards to the State Board of Health, giving it power to approve the appointment of local slaughtering inspectors. These instances are typical of the great growth and improvement in administration. It is unnecessary—indeed impossible—to list them all here.

New Days, New Needs, New Means, New Faces

That remarkable quarter-century, dubbed appropriately the "golden age" of sanitation, was the time during which the Massachusetts State Board of Health was a conspicuous contributor to scientific progress, but the days of the Board itself were numbered. The magnitude and the far-reaching social consequences of the component sciences of the new public health called for new methods and new types of organization. No longer could an unpaid Board shoulder anonymously the responsibility for all the variety of services which health administration implied, no matter how earnest and willing the Board members might be. The day of the amateur administrator was past. Times called for professional, full-time leadership in which the ultimate responsibility could be placed upon a single individual.

It is strange that so little is remembered today about the men and women who influenced the legislature to change the organization of the State health agency. Dr. Enos Bigelow, a man of parts, and influential member of the Massachusetts Medical Society, a member of the General Court, was one instrument. Other physicians joined him in asking for the change. It is likely that age, and time too, played a part. Henry Pickering Walcott was seventy years old. For thirty years his vigorous personality had dominated every phase of the State Board's work. He maintained an intimate and a firm control upon each of the special activities of the staff. Holding a team with a tight rein may help it pull a heavy load, but when the team grows in number, the reins may be too many for one pair of guiding hands, however firm those hands may be.

Perhaps New York State pointed the way to change. Herman Biggs, already a national as well as state leader in public health, was chairman of a New York survey committee, which had recommended in 1913 a

departmental organization for the health administrative agency of that State. Necessary legislation was passed and he was appointed commissioner. Many leaders noted, and applauded this pioneering in the science of public health administration, and Massachusetts especially, must have heeded for the whole government of the Commonwealth was in process of reorganization along modern lines.

Whatever may have precipitated the change, an act was passed in 1914 dissolving the Massachusetts Board of Health and creating the State Department of Health.

BENCH MARK 1914

A New Department Breaks New Ground

Of the several bench marks, that of 1914 is perhaps the most warmly reassuring of all, for we see here our democratic institutions beginning to function at their best. Ready at hand was a new and potentially more efficient health administrative instrument which could be sharpened and improved, or dulled, by the caliber of the staff assembled to man it.

The then Governor, Hon. David I. Walsh, sought the ablest man available to fill the newly created commissionership. He succeeded in inducing the United States Public Health Service to release to Massachusetts, Dr. Allan J. McLaughlin, an officer who had proved his abilities in the field of health administration and a man of outstanding leadership and ability. Incidentally, he had enjoyed a wide international experience having served in the Philippines soon after they were released from Spanish domination. To advise and consult with the new Commissioner, the Governor appointed to the Public Health Council men extraordinarily qualified to uphold his hands. On it he placed Sedgwick, the professor of biology at the Massachusetts Institute of Technology, and Whipple, the sanitary engineer—and historian upon whom we have leaned for much that is related in this account—and Wheelright, a lawyer of wide attainment. With them were the physicians—Edsall, Gallivan and Lamoureux—all men of prominence in their profession. The new Commissioner and Council wisely retained the services of most of the staff of the old Board. At the head of the divisions, which were to be comparable to their former positions, the Commissioner appointed Goodnough, Lythgoe and Clark. For the new divisions, the services of Kelley, Rosenau and Gunn were enlisted.

Goodnough, Lythgoe And Clark

Surely it is fitting that we halt this story briefly to pay our respects to these outstanding men. Xanthus Henry Goodnough, C.E., had come to the Board of Health twenty-eight years earlier, at the time when it was released from lunacy and charity, as an assistant engineer to the stalwart Stearns, whom he succeeded in 1895. He carried on the traditions of Mills and Stearns to the Sanitary Engineering Division of the new Department which he served as Chief Engineer until 1930, when he was succeeded by Arthur D. Weston, the present Chief Engineer.

As the last century was coming to a close, a young analyst began his work as assistant in the Food and Drugs Laboratory. Forty-six years later, Hermann C. Lythgoe, full of honors and ready for retirement, was to be drafted for the

duration of World War II to continue the direction of the Division of Food and Drugs to which he had been appointed by McLaughlin. At the time of the re-organization, McLaughlin said of him, "Mr. Lythgoe is known to be an expert chemist and analyst and as the director of the division he has demonstrated that he is an energetic executive officer as well." McLaughlin's measure of the man has stood the hard test of many years.

Another gifted administrator who served as quietly and efficiently, and for an even longer period of years was Harry W. Clark, a chemist who followed in the tradition of Hazen and Fuller as director of the Lawrence Experiment Station, finding time to manage the Water and Sewage Laboratories at the State House as well.

Throughout the years of his fruitful, if unassuming, leadership, he was responsible for many advances in the technology of sewage disposal. Imhoff himself attributed to Clark some of the improvements which he incorporated in his methods of sludge digestion in sewage treatment.

Kelley, Rosenau And Gunn

The Division of Communicable Diseases was to embrace all the work done by the former State Board of Health in suppressing epidemic diseases and to cover as well much new territory in the special fields of tuberculosis and syphilis control. It was evident that the proper direction of such an extensive service required the full-time attention of a competent public health administrator. The new Commissioner was successful in securing as Director of this Division, Dr. Eugene R. Kelley, formerly Commissioner of Health for the State of Washington. Not only was he a man of proved epidemiologic skill, but when larger responsibilities were to come to him he was to reveal that he was endowed with the vision to guide an expanding department into new fields of endeavor opened by the sharpened needs of a postwar world. It is said of Dr. Kelley that throughout his career he knew more people and was known by more people than any other man in health work. He was influential in the Conference of State and Provincial Health Officers and the American Public Health Association.

Dr. Milton J. Rosenau, a teacher of preventive medicine, once a member of the old Board, and formerly Director of the Hygienic Laboratory of the United States Public Health Service, took charge of the new Division of Biologic Laboratories when Theobald Smith resigned because of the larger opportunities offered him by the Rockefeller Institute. Rosenau carried the laboratory through six difficult years, from the outbreak of the first World War with its critical shortages of personnel and supply, into the period of postwar reaction. Under Dr. Rosenau the laboratory acquired a license from the United States Public Health Service. Compliance with the high standards demanded for this license, further insured the quality of the products of our State Laboratory.

Closest to the heart of Dr. McLaughlin was the new Division of Hygiene. In planning the departmental program, McLaughlin envisioned this new agency as one which would undertake a field broad enough for three divisions into which he hoped the work might ultimately be divided. To launch its ambitious and far-reaching program—on the very small funds available for the purpose—required a division chief who would be resourceful, energetic and would be blessed with sound judgment. Selskar M. Gunn, Professor of Hygiene at the Massachusetts Institute of Technology, was appointed on a part-time basis. Of him Dr. McLaughlin says, "Because of his dynamic force he has been able

to accomplish more than other available men would have accomplished on full time." Of such was the stuff of the men whom the Commissioner and Council selected to guide the destinies of the new Department of Health. Once again Massachusetts had shown that a public service could be organized without carrying a burden of incompetents.

The 1915 Report Paints a Picture of Men at Work

We can visualize the beginnings of this promising reorganization by selecting a few brief, "thumbnail" quotations from the account of the departmental activities in the first annual report of the new Department:

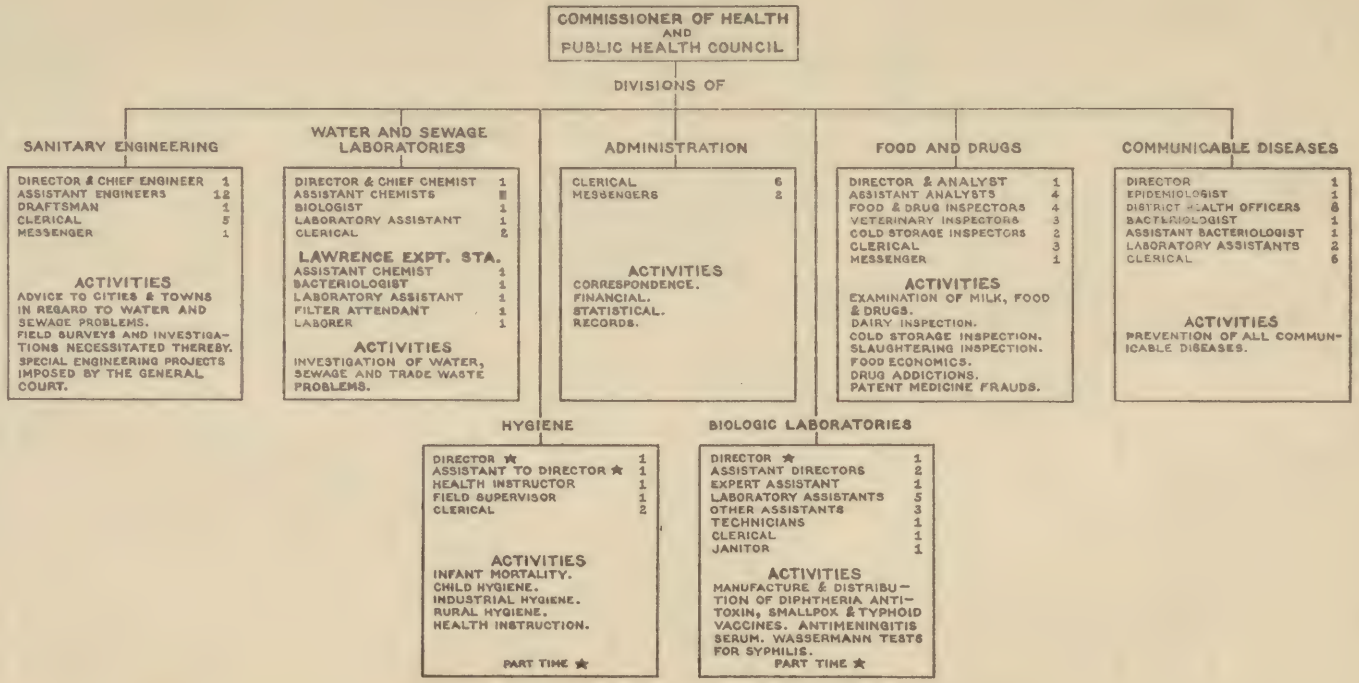
> "The Engineering Division was in existence as a smooth running unit under the old State Board of Health. It is in charge of a highly efficient engineer, Mr. X. H. Goodnough, who also possesses executive ability of a high order.
>
> "The division has been operated together with the Water and Sewage Laboratories and the Lawrence Experiment Station, chiefly under appropriations for purity of inland waters and examination of sewer outlets.
>
> "The work of the Engineering Division has increased enormously because of the increase in requests for advice from cities and towns. . . . The field work of the engineers in complying with these requests from cities and towns has increased to such extent that for three years the field force has been overtaxed."

The Commissioner added this yardstick: "The splendid work of these two divisions (Sanitary Engineering, and Water and Sewage Laboratories) in the past in safeguarding the public water supplies of the State is best expressed by the enormous reduction in typhoid fever."

The tables he offered as evidence show that, for the five-year period ending in 1900, the average annual typhoid fever rate was slightly in excess of 25 deaths per hundred thousand. For the five-year period ending in 1910 the average rate had fallen below 14 deaths per hundred thousand, whereas for the same period ending in 1915 the average rate had sunk to 7.8. "In addition to controlling public water supplies," he added, "very interesting problems in trade wastes are being solved in the laboratories and very valuable research work has been done in regard to depth of sewage filters which activated sludge."

The largely unrelated activities classified under the general head of Food and Drugs had been carried on by the old Board in several different locations by inspectors and chemists who found themselves each responsible to several heads. These positions were transferred to the new Division of Food and Drugs. "I believe," writes Dr. McLaughlin, "that a Division of Food and Drugs would contemplate a broader field than the mere examination of milk, food and drugs. The question of drug addictions, the misuse of so-called proprietary and quack medicines, all present fruitful fields of action." So the new Division bravely set out on its appointed tasks. One example of the variety of problems it faced is typical. Before World War I, America had depended upon Europe to supply the arsenicals used in the treatment of syphilis. When war cut the supply it was discovered that the German patent formulas were fraudulent. It became necessary for the Division of Food and Drugs quickly to synthesize a safe drug, and having accomplished this, to manufacture the new arsphenamines. The Division continued to make these products available for the Commonwealth until

Organization of Massachusetts Department of Health
November 30, 1915.



improved commercial techniques made it possible to supply the drugs at prices lower than the Division's cost of production.

Not only did the Communicable Disease Division face from the beginning, the control of the usual epidemic diseases by the time-honored method of isolation, but it had to master an entirely new technique of disease prevention, for diphtheria prophylaxis was soon to become a reality. Almost from its first days, the division demonstrated the Schick Test, and both Schick testing and immunization entailed a brand new educational effort if parents were to be persuaded to permit their children to be tested and protected when found susceptible. The point need not be labored that Kelley and his staff found plenty to do.

The act creating the new State Department of Health provided for the employment of eight full-time district health officers instead of the fifteen part-time physicians who had devoted much of their effort to the investigation of the health of factory workers. Though these district health officers were to be the representatives of the entire State Department of Health in their respective districts, the supervision of their work was a function of the Director of the Division of Communicable Diseases. Upon them Kelley placed responsibility for much of the pioneering in promoting general Schick-testing, and later, diphtheria immunization.

From the same annual report we get the most revealing picture of the ambitious program proposed for the new Division of Hygiene:

> "Health officers," wrote Commissioner McLaughlin, "are justified in being proud of the achievements in the prevention of disease and the reduction of the death rates which are recorded in recent years, due largely to official activity. We have now reached a point, however, where further progress demands the hearty support of the individual citizen, and wider application of the principles of personal hygiene by the individual citizen himself. This means education of the people in their obligations to their neighbors and in the simple gospel of disease prevention. . . .
>
> "To reach these people, two very effective agencies are in our hands. . . . I refer to the possibilities of public health or visiting nurses and to the hygiene of school children. In view of the great reductions already effected in the mortality rates for tuberculosis, typhoid fever, diphtheria, and other diseases, largely due to official activitity, it may be said in Massachusetts that further reductions will be in direct ratio to the number of women employed in public health nursing. . . .
>
> "We must concede that this part of the health officer's problems, in which success depends upon the voluntary cooperation of the individual, is much more difficult than that which may be solved by the passage and enforcement of laws and ordinances. The skepticism, and apathy, the passive and even active resistance displayed toward health instruction comes largely from an adult population whose early training did not include hygiene.
>
> "To care for this problem of health instruction the new Division of Hygiene was created. Its scope will include infant mortality, child welfare, medical examination of school children, industrial hygiene, and health instruction in general. It will devote much of its energies to educational methods through literature, lectures illustrated by moving pictures and lantern slides, and personal instruction by its exhibits and health instructors. No special legislation can absolve this Department

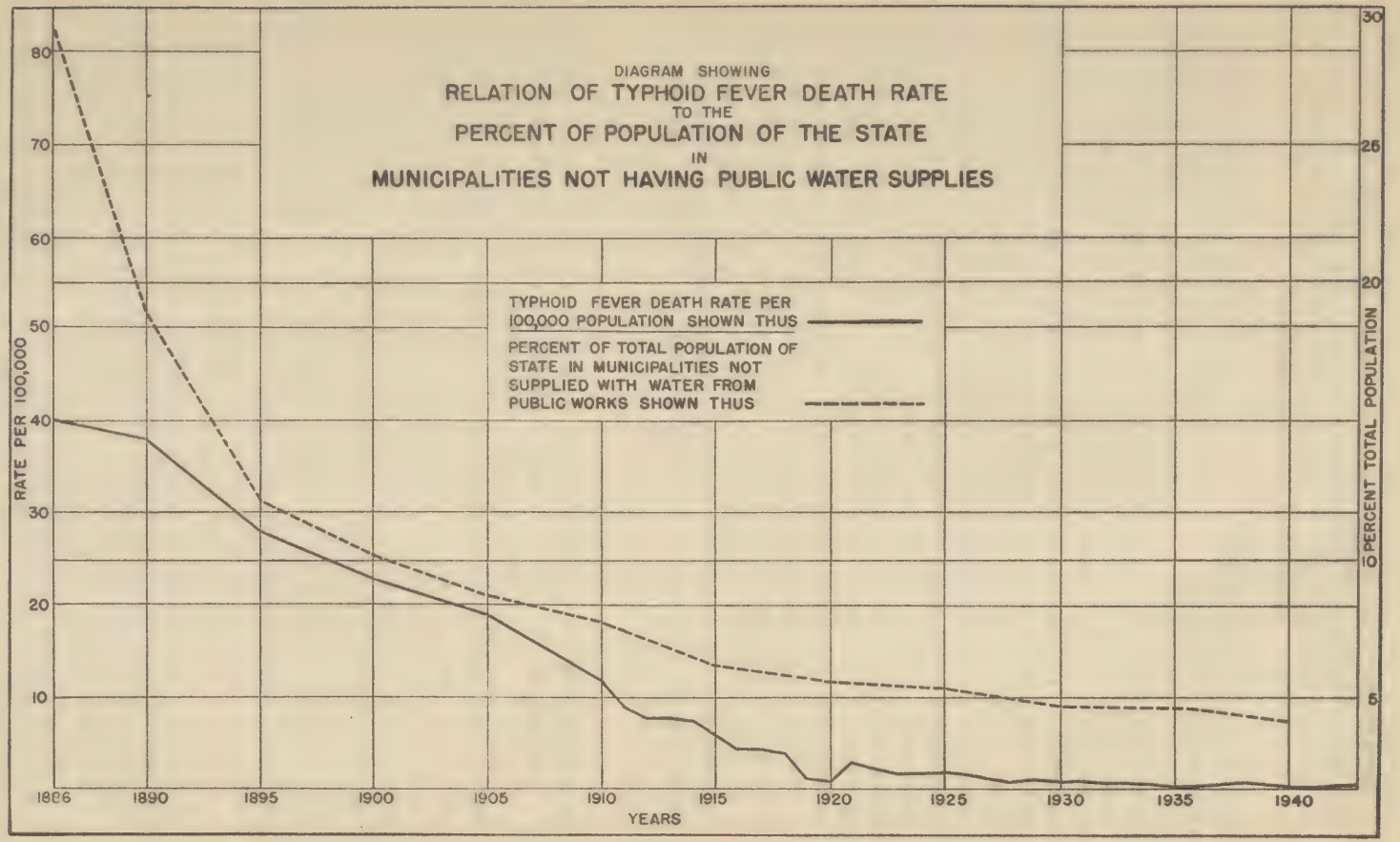


DIAGRAM SHOWING
RELATION OF TYPHOID FEVER DEATH RATE
TO THE
PERCENT OF POPULATION OF THE STATE
IN
MUNICIPALITIES NOT HAVING PUBLIC WATER SUPPLIES
TYPHOID FEVER DEATH RATE PER 100,000 POPULATION SHOWN THUS
PERCENT OF TOTAL POPULATION OF STATE IN MUNICIPALITIES NOT SUPPLIED WITH WATER FROM PUBLIC WORKS SHOWN THUS
RATE PER 100,000
PERCENT TOTAL POPULATION
YEARS
80
70
60
50
40
30
20
10
30
25
20
15
10
5
1886
1890
1895
1900
1905
1910
1915
1920
1925
1930
1935
1940

from its obligation 'to take cognizance of the interests of life and health among the citizens of the Commonwealth'.

"The possibilities of this division in life-saving and disease prevention exceed those of all the other divisions combined."

Each Division Charged With a Definite Life-Saving Job

So we catch a glimpse of the several activities of the Department of Health taking shape, and with many growing pains, the divisions achieving a maturity of purpose in their ambitious programs. The new Department had inherited from the old Board a communicable disease problem so extensive that detailed investigations were out of the question—except in direct emergencies. The numbers of cases of such diseases as typhoid fever and diphtheria were huge as compared with what we have become familiar in recent years. At the beginning of his administration, Commissioner McLaughlin charged each of the various divisions with responsibility for its appropriate share of the existing death rate. The Division of Communicable Diseases, for example, was debited with 15,920 annual deaths which included mortality from syphilis, tuberculosis, pneumonia, diphtheria, measles, scarlet fever, typhoid fever, whooping cough and influenza. Later because of the creation of new divisions for handling these particular diseases, syphilis and tuberculosis were removed from this list leaving a total of 7,920 deaths within the province of the division. If the same allocation were to be made at the beginning of 1944, the total number of deaths for which this division could have been held responsible would have been only 1,020. This, more clearly than anything else, indicates the tremendous reduction in the incidence of communicable disease which has taken place during the last twenty-nine years.

An All-Out Attack On Pneumonia

Soon after the reorganized Division of Communicable Diseases began its control activities, the Rockefeller Institute announced the production of a serum for the treatment of pneumonia caused by certain types of pneumococci and the Department took steps immediately to make use of this discovery. Because lobar pneumonia was the outstanding cause of death among the diseases still debited to the Division, the condition was made reportable and the manufacture of a serum for the treatment of Type 1 pneumonia was begun. The serum was eventually made bivalent by the addition of Type 2. However little use of the serum was made at the beginning, except in metropolitan hospitals where the then cumbersome methods of typing pneumococci could be carried out. After Dr. Felton of the Harvard Medical School produced a more potent product by the chemical concentration of batches of serum supplied by the State Antitoxin and Vaccine Laboratory, a more effective therapeutic agent was available, but still the serum treatment of pneumonia was limited because no practical method for treating cases in the home could be devised due to the lack of laboratory facilities for typing pneumococci.

The Department was dissatisfied with this state of affairs and decided that the program must be either expanded or discontinued. This wholesome dissatisfaction led to action. A five-year study was outlined and the proposal

presented to the Commonwealth Fund of New York City as a project worthy of their underwriting. The Fund agreed to supply the means to carry out the study which was to cover three important phases: (1) laboratory investigations to improve the potency and quality of serum; (2) epidemiologic investigations to add to our knowledge of the nature and mode of spread of the disease; (3) field demonstrations to encourage the use of anti-pneumococcic serum by practicing physicians. Noteworthy accomplishments resulted in all three of these fields. The use of serum increased markedly and many hundreds of lives were saved during the period of the five-year study. A rapid method of typing pneumococci by the Neufield reaction was initiated by the bacteriological laboratory of the Department and this increased the effectiveness of the program* and over eighty typing laboratories and serum distribution centers were set up in hospitals throughout the Commonwealth.

It would be impracticable to trace the work of the Division of Communicable Diseases in connection with all the infection during the two decades of administrative expansion under review. Although the Department has been a pioneer in devising and applying new methods to the control of diseases other than pneumonia, it is difficult to leave this intriguing subject without some reference to the related work of the Diagnostic Laboratory. For the first two decades of its existence, one bacteriologist had been able to perform with reasonable adequacy the limited number of examinations which science had perfected but, with the reorganization of the Department, Miss Edith A. Beckler, who has been in charge ever since, was appointed a full-time bacteriologist and the staff began thereafter to increase rapidly. Within a few years, it became necessary to keep the laboratory open daily and Sundays and to give twenty-four hour service—one bacteriologist being on call during the night. The work of the Laboratory had been limited mainly to the bacteriologic diagnosis of communicable diseases. Laboratory tests such as urinalyses and blood chemistry had never been undertaken, but the development of serum and drug therapy of pneumonia complicated the work and imposed further burdens, for a variety of detailed studies may be necessary upon a single specimen from a case of communicable disease. Such studies have proven valuable to the epidemiologists of the Department in tracing sources of infection, and intricate bacteriological work of this nature has continued to increase to this day.

With the creation of a venereal disease subdivision in the new Division of Communicable Diseases, a Wassermann Laboratory was opened as a unit of the Division of Biologic Laboratories under Dr. William A. Hinton, who was to give to the country a simplified but sensitive blood test which bears his name.* Soon, thereafter, the State Department of Health declared syphilis and gonorrhea to be diseases dangerous to the public health—which must be reported. A program for handling and recording case reports of gonorrhea and syphilis was formulated and set in motion.

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* Just as the use of antipneumococcic serum was becoming universal, the sulfonamide drugs were introduced for the treatment of pneumonia. These drugs, and later penicillin, have proved so effective that the need for serum treatment is greatly reduced. However, serum still plays a role in the pneumonia control program. In certain cases of pneumonia, serum remains essential to good treatment. So, despite the marvels of present-day drug therapy the pneumonia studies of the Department may be set down as one of the modern contributions comparable to those which came from the Board's staff during the middle nineties.

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* A survey conducted jointly by the U. S. Public Health Service and the American Society of Clinical Pathologists has shown the Hinton test, as carried out in this laboratory, to rank among the first three in nationwide evaluations.

With the Treatment of Venereal Diseases the Department Embarks Upon Medical Care

Free diagnostic facilities for venereal diseases were put into operation and efforts made to establish a state-wide chain of clinics. Distribution of arsphenamine was instituted, and when the first World War came, the State venereal disease control program was geared to the nation-wide plan of the War Department and United States Public Health Service. Twelve clinics began to function when the Federal allotments under the Chamberlain-Kahn Act, with matching funds from the State, provided the means for these health and medical services. An ahead-of-the-time study of social service needs of venereally diseased patients was initiated and the first medical social worker in the Department was appointed as a result. According to the annual report of that first war year, "The Subdivision of Venereal Diseases has been able to function better. . .due mainly to the addition of a social worker and a special investigator. . ." The duties of both these new employees included the follow-up of infected cases, visits, and cooperative work with boards of health, State clinics and social services. The report comments, "Pleasant cooperation was established, but with only one social worker in the State an effective demonstration of the possibilities of medical social work was scarcely possible."

An Ambitious Program In Hygiene

In his original assignment of deaths to be prevented, Commissioner McLaughlin had assigned to the Communicable Disease Division the task of preventing deaths from the epidemic diseases; but upon the Division of Hygiene, he imposed a still greater responsibility. Control of deaths from the diseases of infancy, tuberculosis, cancer, and all the so-called wear and tear diseases of adult years was placed on the shoulders of the hygienists. This was a large order. The early years of this new division were of necessity exploratory, for there were few precedents to guide it. A dozen different surveys, tentative activities and demonstrations were gingerly attempted. A statistical study of the infant mortality of 355 towns was undertaken to determine where the health educational needs were greatest and what means might be employed to meet them.

A health lecture service and a motion picture distribution plan were set in motion. Health films of that day left much to be desired, but they did serve as bait to draw audiences. Health education was in the stage of trial and error—performance might be less than perfect, but aim and spirits during this period were high. An ambitious child health exhibit with the usual profusion of panels* was hurried from community to community by two public health nurses who interpreted for the open-mouthed audiences the wealth of statistical data the panels displayed. The nurses gave numerous talks to children as a sideline feature. The breadth of the educational interests of the division are indicated by the appearance of such diverse brochures as the booklet "Baby and You" and a pamphlet on mosquitoes and malaria. The former monthly bulletin, dignified now by the title "The Commonhealth" made its pedagogical bow to the Commonwealth.

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* The twenty panels of the child welfare exhibit called attention to successive steps in the care of infants and children. In great profusion were displays of model layettes of baby clothing; iceboxes; infant feeding outfits; horrible examples of ill-kept rooms, and, by way of contrast, an attractive nursery. As evidence of the area which infant hygiene proposed to include, a polluted water supply and a protected one were thrown in for good measure. The extent of the infant mortality problem was dramatized by means of a "flashing device," so the report informs us.

For a number of years both the Department of Education and the State Board of Health had had responsibilities placed upon them to guard the health of school children, but there had been little collaboration between them. Shortly after 1918, a closer liaison was effected between these two departments for there was a growing interest in the health of the school child on the part of both. A record form was devised to improve annual medical examinations of school children which were supposed to be carried out in every community in the State. Joint conferences were held by the two departments with school superintendents, physicians and nurses in order to promote a better understanding of the possibilities in school health administration. State normal school summer courses were given so that teachers and school nurses might gain some appreciation of the value of the health instruction of the children in their charge.

Some measure of the deficiencies of school health supervision of that day is found in the number of full-time medical inspectors in the entire State. There were three. In addition to stimulating good medical services, the Department sponsored the passage of a law requiring a school nurse for every community. Within a few years this requirement had been fulfilled. Neither was the subject of nutrition to be neglected, for a staff member, officially labelled "qualified food worker," was employed to write and talk on the broad topic of food in all its hygienic aspects. One good thing leading to another—a "mouth hygienist" was later added to the staff, largely because of the efforts of Dr. Edwin P. Kent who had given his services in laying the groundwork for a dental program.

Insistent demands of a nation at war deprived the State of Allan McLaughlin's able leadership, but Dr. Kelley, with rare administrative capacity, succeeded him as Commissioner and directed the Department so successfully that it met its larger obligations which had been revealed dramatically by the first World War draft.

As the scope of the Division of Hygiene's activities had been stretched to encompass the cradle and the grave, the administrative obligations involved were so onerous that no part-time head could possibly direct them all. Professor Gunn —and his immediate successor—bowing to inexorable reality, had resigned and when Dr. Kelley assumed the commissionership, he appointed immediately a full-time director of the Division of Hygiene. He selected Dr. Merrill E. Champion, a district health officer, to undertake the job of guiding the varied and seemingly unrelated parts of the divisional program.

From its inception, the preponderant part of the effort of the Division of Hygiene was directed toward child health, the remainder being devoted to adult hygiene. During these early years, the staff continued to show the multipaneled educational exhibit at county fairs. In connection with this display, a pediatrician gave free examinations to children who were presented by their parents. A dental hygienist looked into the children's mouths, while a nutritionist demonstrated to their parents all the foods that might later go into the same mouths. Perfectionists among present-day psychologists and pedagogues may frown upon such side-show demonstrations as educational devices, but the interest they generated in the townspeople who swarmed to the fairs did much to stimulate the desire for school nursing services under local auspices throughout the State.

The success of the child health exhibits at the fairs led the Department to widen the field of this educational device. A model "T" Ford truck to transport it and an allegedly portable tent to house it were purchased. A troupe of per-

formers was organized to take the show to granges, health weeks, indeed to any place where an audience could be induced to gather. The nurses, nutritionists and educators lugged their own trunks, they cleaned the hall, they set up the "pitch" like any trouper, then hurriedly changed their costumes and put on the show, a part of which was a dramatic performance called "The Lion and the Nurse," of which it is said, that in its histrionic effect "Uncle Tom's Cabin" paled in comparison. When the last child and parent had been entertained, examined or instructed, the crew folded their tent "like the Arabs" and wearily called it a day. After some years of trouping the realization began to take shape that this shotgun educational method might better be superseded by an effort aimed more particularly at definite hygienic objectives.

Early Days of Well Child Conferences

Inspired in part by the portable educational exhibit, well child conferences were conducted at the request of some responsible local agency with permission of the board of health, and were held in a school house, town hall or some other central building. No medical treatment of any kind was given. The purpose of the clinic was merely to demonstrate a need and a method of meeting it. When children were found ill or in need of corrective treatment, they were referred to the family physician. Not only was no medical treatment given, but the conferences were intended to be demonstrations only. Once their value had been made clear, the Division felt its duty had been fulfilled, temporarily at least, because the responsibility for carrying on the work now rested with the community itself. The services of the State staff were always at the disposal of the community to assist, but not to supplant, local child health activities.

Although the legislature, with rare and typically New England independence, refused to accept the Federal funds allocated to States under the Sheppard-Towner Act, it did increase appropriations for child health work to such an extent that it was possible to employ an adequate staff of competent specialists in the fields of pediatrics, dental hygiene, public health nursing, and nutrition. (It may be of interest to note that although Sheppard-Towner funds were refused, a previous legislature had not been averse to matching Federal funds appropriated for venereal disease control under the Chamberlain-Kahn Act.)

Tuberculosis Prevention Becomes A Major Activity

Soon after the State Board of Health was reorganized to form the State Department of Health it became apparent that the treatment and prevention of tuberculosis was a major obligation which could not effectively be met as a subdivisional activity of the Communicable Disease Division. A general rearrangement of many Massachusetts Boards and Commissions effected a second reorganization of the Department of Health, in which the name was changed to the State Department of Public Health. One of the chief purposes of the reorganization was to delegate to the Department the administration of the Commonwealth's tuberculosis sanatoria. So, a State Division of Sanatoria and Tuberculosis was duly established in the Department and the administration of the hospitals was transferred from the Boards of Trustees who had formerly managed these institutions. To Dr. Sumner H. Remick, the second Director of this Division, is due the major credit for the sound planning of the next decade which served to place Massachusetts in the front rank of

sanatoria administration. Of interest to the collector of odd items, is the transference of the Penikese Leper Hospital to the Division along with the sanatoria. Few people are aware that the State ever maintained a hospital for lepers—or indeed that there were lepers in Massachusetts.

Prior to the passage of the reorganization act, the tuberculosis work of the Department had been carried on through the district health officers and the central staff of the Division of Communicable Diseases. Reports of cases and deaths from tuberculosis came from physicians and boards of health, and lists were compiled of known cases covering the period between reorganizations. To the district health officers now was given the job of putting these lists to practical use in the solution of the tuberculosis case-finding program.

Chadwick Clinics Begin Ten-Year Project

High mortality from tuberculosis among adolescents, both in the State Sanatoria and in homes throughout the Commonwealth, so impressed the State legislature that, at the close of the first quarter of the twentieth century, a State program was authorized for the prevention and control of tuberculosis in childhood. Under the leadership of Dr. Henry D. Chadwick, mobile clinics were organized for the examination of school children, using the tuberculin skin test as a screen and providing X-ray chest examinations for those showing positive reactions. By the discovery and treatment of the then-called childhood infections, it was thought possible to prevent the development of tuberculosis in adult life. During this period of ten years, nearly a half million children were examined and several thousand were hospitalized. Two State sanatoria were converted into institutions for the care of children.*

The second half of this period of departmental growth (1925-1936) began tragically. Dr. Kelley, still a young man with a challenging future, had taken up the burdens of administration where Dr. McLaughlin had been forced to drop them. In a few brief years he had measurably increased both the scope and the life-saving values of the departmental program. His sudden death came as a disheartening blow to his associates, every one of whom was a devoted friend filled with admiration of him as leader and man, and it required all the really great capabilities of the versatile George Bigelow to rally them from their despondency. But Dr. Bigelow, brilliant in mind, shrewd in leadership and always inspiring, tossed into the task of carrying on the work of the Department all his seemingly inexhaustible store of vitality. He succeeded not only in creating a new will to achieve, but at the same time he overcame a continuing public indifference to the need of good health services with a good-natured gusto, but often with scarcely-veiled sarcasm.

This was a period of economic ups and downs. The roaring twenties, with their promise of "permanent prosperity", saw the Department embark upon a cancer program as radically new and as far-reaching in its potentialities as the

* Although the hope of preventing tuberculosis by the hospitalization of children with primary disease was not realized, the Chadwick clinics proved as useful to the science of public health administration in their negative findings as in their positive answers to the questions of tuberculosis prevention. The program had far-reaching results in the education of the public about tuberculosis. Among the significant facts brought out was the relatively high resistance in children between three and ten, and the high fatality of tuberculosis in the teen ages. The survey showed that under present day conditions, tuberculosis disease in childhood occurs in such a small percentage of cases that the routine examination of children in the elementary grades is not justified. But the findings did indicate the age groups and the social conditions under which tuberculosis testing might profitably be intensified. All in all, the Chadwick clinics contributed greatly to the nation's understanding of the problem.

celebrated Chadwick clinics were in the field of tuberculosis, and when the prosperous twenties had given way to the desolate thirties, the departmental activities turned toward the relief of human want and malnutrition.

Events demanded that the Division of Hygiene be separated into two new and independent divisions—one to be concerned with adult health, the other with maternal, infant and child health. For administrative purposes the dividing line in the responsibilities of the two new agencies was to be age eighteen.

Adult Hygiene—Euphemism For Cancer Control

Early in his administration Commissioner Kelley broke new ground when he asked for an appropriation to be used for the control of cancer, for no other state health agency had entered this field. The funds he received were used to inaugurate the tumor diagnostic service and to carry on a statewide educational program—treatment having no part in this plan. Meanwhile, Monsignor Roche, a Chaplain of one of the few hospitals which then would accept cancer cases for terminal care, became the central figure in a movement demanding of the legislature the granting of appropriations for a State hospital to care for cancer patients. Though a joint committee of the Departments of Public Health and Public Welfare opposed a State supported hospital and recommended that the Department concern itself with promoting the extension of facilities for the care and treatment of the disease, the legislature ordered the establishment of both a hospital and diagnostic clinics which were to be administered by the Department of Public Health. A vacant institution was reconditioned to care for cancer patients—the Pondville Hospital.

Three years elapsed before the Division of Adult Hygiene was created, and during the interim the cancer program was carried on by a cancer section in the Division of Hygiene. When the new division was established, the name Adult Hygiene was used as the word cancer was then held to be too obnoxious. There was no intention at that time of entering generally into the broad field of the hygiene of the adult.

The cancer program evolved by a committee appointed by the Commissioner had as its principal feature: cancer clinics, tissue diagnostic service, hospitalization of cases, public education and both etiologic and evaluative research. The plan was accepted, the General Court appropriated funds for twelve diagnostic clinics, and so the Department was embarked upon the first cancer control program to be undertaken in any State. With the exception of the administration of the cancer hospital, which was placed with other department hospitals under the jurisdiction of the Division of Tuberculosis, the cancer program was administered by the newly formed Division of Adult Hygiene.

Diagnosis and treatment are not enough. Cancer control, like that of tuberculosis, is a social problem. People must be induced to seek protection. One of the most influential activities in the cancer clinic program proved to be the first of the "Cured Cancer Clinics." These were reviews of case records of patients from whom proved cancers had been removed, and who had lived beyond the time of probable recurrence. These "Cured Cancer Clinics" were most influential in changing the attitude of the practicing physicians of the State toward the control program, from one of skepticism to one of warm support. Although the practicing physicians came to appreciate the value of the whole cancer preventive program, there was

evidence that the public could not thus be awakened to the life-saving possibilities in cancer control. A realization of this public inertia set the Division in search of a new educational device, which later came into being.

Emergency Relief Colors Child Hygiene Program

The exigencies of the world-wide depression of the early thirties was not without its effect upon the program of the Child Hygiene Division which had just been separated from adult health work. Not-to-be-denied demands for concrete relief measures, rather than for professional guidance, were heard throughout the State. It was a time for bold decisions, and Dr. M. Luise Diez, the newly appointed Division Director, made them gallantly. The day's work was concerned more than ever with such practical matters as low-cost menus for children and pregnant women, and inexpensive meals for other adults as well. One nutritionist was sent to the then bankrupt city of Fall River to devote her entire time to a struggle with the dire problems of planning meals on a subsistence level. Calls came from wholesale and chain grocers for help in passing on the day-to-day advice about food economies to their hard-pressed customers. Great quantities of leaflets on nutrition for the emergency were struck off for quick distribution throughout the State. The American Red Cross, busily distributing flour to the needy, called for the active support of all the nutritional staff to help them in educating homemakers.

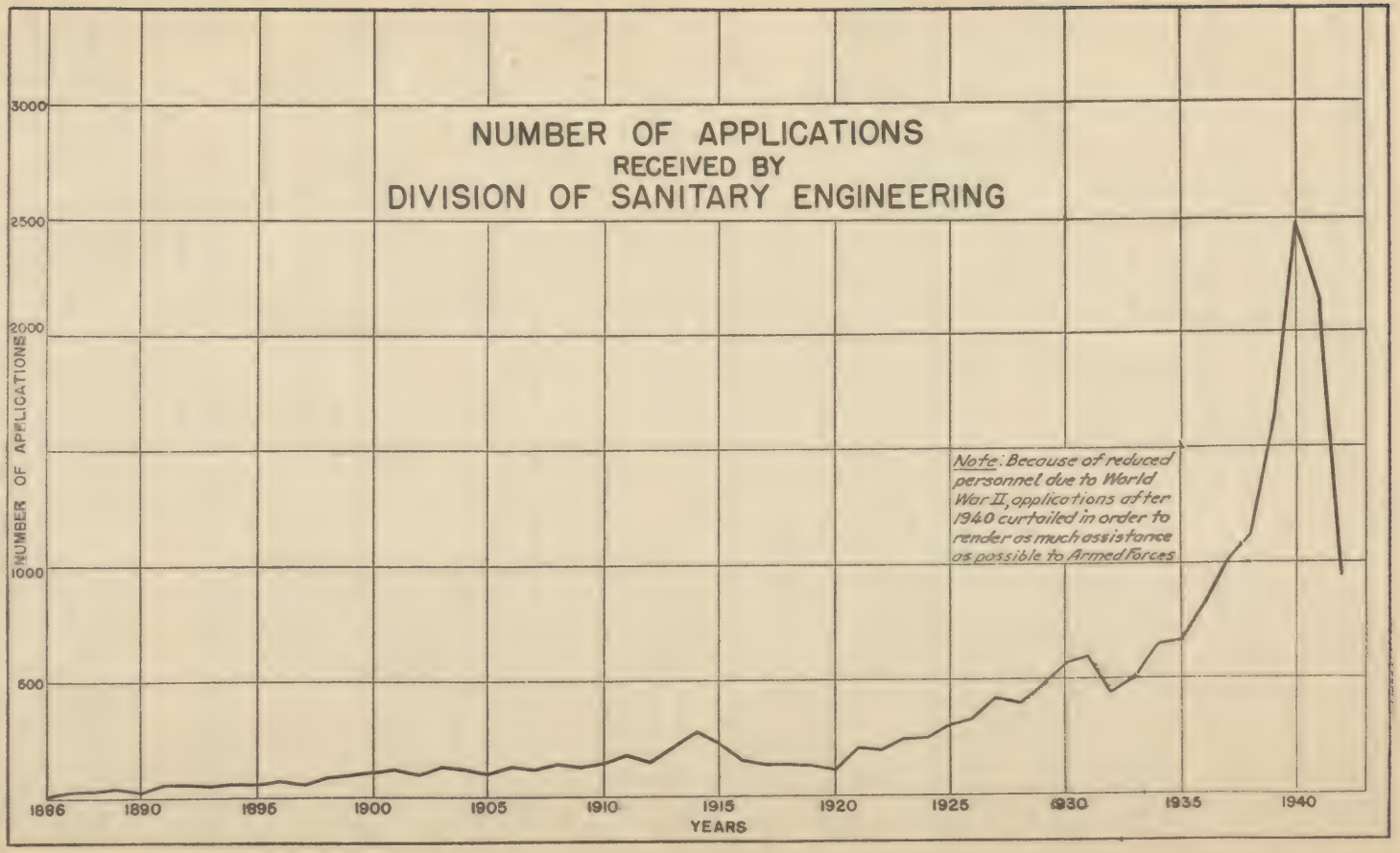
In cities where the need was greatest, the nutritionists entered the markets to give on-the-spot advice about economical wholesale buying. Surveys made of school meals revealed their nutritional inadequacies, and as a result demonstrational school lunch projects, some free, were conducted in the neediest communities throughout the State. Pediatricians, nurses and nutritionists alike pitched in to give hard pan services.

It should be noted, however, that the staff, even as they rose to these emergencies, did not neglect their demonstrational well child conferences and other services designed for long-range health improvement. Dental hygienists continued to conduct research on the health of children in sanatoria. High school health councils were being formed, and a demonstration in health education was given in one of the Lynn high schools in cooperation with the Massachusetts Tuberculosis League.

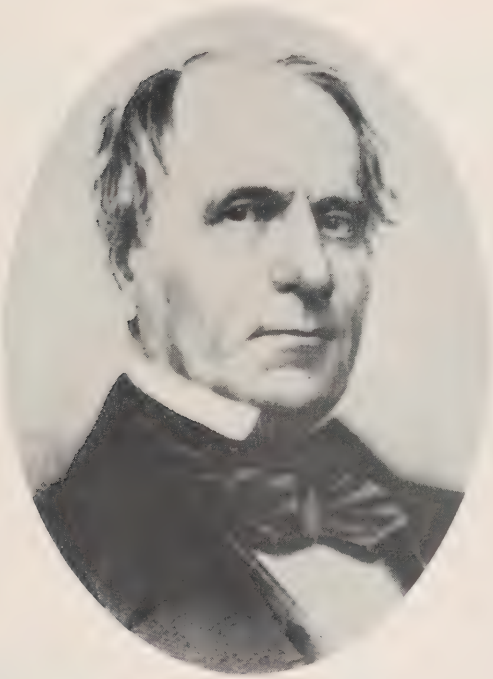
It would be unprofitable to enumerate here all the conventional sanitary and preventive medical services which the various divisions of the Department continue to perform during fair economic weather and foul, but this account cannot overlook several of the more newsworthy activities that were undertaken or developed during this eventful decade in the Department's history.

Path-Finding in Shellfish Sanitation

Clams grown in polluted water create a health hazard which had long been a matter of Department concern. The law had obligated it "to examine from time to time the tidal waters and flats of the Commonwealth and samples of shellfish therein" to determine if they were unfit for food and dangerous to the public health. Many areas where shellfish grew abundantly were found polluted, so experiments were begun at the Lawrence Experiment Station to determine the practicability of purifying soft-shelled clams from the less grossly polluted areas. Later these experiments were conducted on a larger scale


NUMBER OF APPLICATIONS
RECEIVED BY
DIVISION OF SANITARY ENGINEERING
NUMBER OF APPLICATIONS
3000
2500
2000
1000
500
1886
1890
1895
1900
1905
1910
1915
1920
1925
1930
1935
1940
YEARS
Note: Because of reduced personnel due to World War II, applications after 1940 curtailed in order to render as much assistance as possible to Armed Forces

PIONEER IN PUBLIC HEALTH



Lemuel Shattuck
1793-1859

SECRETARIES
OF
MASSACHUSETTS BOARD OF HEALTH
1869-1914

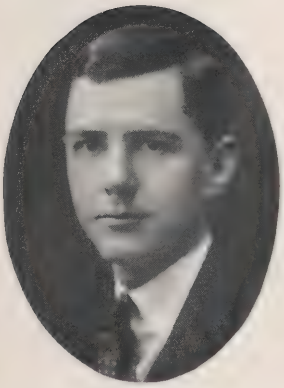
Henry Ingersoll Bowditch, M.D.

Henry Pickering Walcott, M.D.

COMMISSIONERS
OF
MASSACHUSETTS DEPARTMENT OF PUBLIC HEALTH
1914-1933

ALLAN J. McLAUGHLIN, M.D.

EUGENE R. KELLEY, M.D.

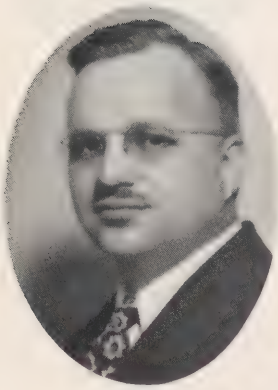


GEORGE H. BIGELOW, M.D.

COMMISSIONERS
OF
MASSACHUSETTS DEPARTMENT OF PUBLIC HEALTH
1933-——

HENRY D. CHADWICK, M.D.

PAUL J. JAKMAUH, M.D.



VLADO A. GETTING, M.D., DR. P.H.

in Newburyport. The outcome was the establishment at Newburyport, of the first shellfish purification plant, in the country—and today the Sanitary Engineering Division maintains close supervision over this useful method of conserving a not inconsequential part of our food supply.

Federal emergency work projects of various kinds made new demands upon the sanitary engineers of the Department. Before the C. C. C. camps could be established, sanitary surveys of the areas proposed for sites had to be made. A wide variety of water supplies and sewage treatment works, the construction to be financed through W. P. A. funds, each had to be approved by the Department engineers before the Federal green light was given. So, the depression complicated the program of the Engineering Division as it did the others.

An explosive outbreak of milk-borne septic sore throat in a small western community which had insisted upon its right to enjoy the dangerous liberty of drinking raw milk was turned to good use elsewhere in the State. In the years which followed, numerous Massachusetts communities have adopted regulations for the pasteurization of all market milk so that more than 90% of the entire population of the State now enjoys safe market milk. In some areas cooperative pastuerization plants smoothed the way to the enforcement of municipal regulations.

Biologic Laboratory Branches Into New Fields

Once again the irresistible pressure of departmental growth made impracticable part-time administration, however competent, and Dr Rosenau resigned to give his entire time to teaching and research. The consolidation, improvement and expansion of the Antitoxin and Vaccine Laboratory's work was stepped up under Rosenau's successor, Dr. Benjamin White, who took over the direction on a full-time basis. Dr. White took a leading part in the Department's diphtheria control program, which was built about the production of toxin-antitoxin mixture and a state-wide campaign of education in its use. Thus, by the time diphtheria toxoid became available, a decade later, the recognition of the value of such a prophylactic agent was thoroughly established throughout the State. Later, as the pneumonia control program developed, higher types of antipneumococcic horse serum were added to the production schedule, with the subsequent development of therapeutic rabbit sera for pneumococcus typing reagents. The demand for therapeutic serum greatly expanded as its use became more widely understood, and sera for all types of pneumonia were made available, some by state purchase.

The scarlet fever control program of the Department was extended to include experimental production of scarlatinal streptococcus toxin and toxoid, and processing of convalescent serum obtained from—and returned to—certain cooperating towns and cities. Community participation in a convalescent serum program was difficult to maintain, due to the irregular occurrence of the disease in any one area, and this part of the program was ultimately abandoned. The experience gained, however, showed that the only logical way to organize a convalescent serum program was to place it on a larger population basis—thus ensuring more or less continuity in the supply and demand, and providing a central processing and distributing center on which any community could draw when in need.

Use of scarlatinal toxoid in preventing the disease has not as yet progressed

beyond the experimental stage. Studies carried out by the Division of Communicable Diseases, based on one year follow-up Dick tests of individuals inoculated with toxoid, have shown an immunity rate considerably lower than that obtained, for example, with diphtheria toxoid; furthermore, the chemistry of scarlatinal toxin renders its detoxification a long and uncertain procedure. The problem remains one to which an answer is yet to be found. The work on scarlet fever led, however, to the development of methods for production of extremely high potency toxin and for titrating the toxin *in vitro* by means of a flocculation test.

Measures of Progress

A fitting commentary on the ultimate effect of these two decades of departmental growth, from its inception in 1915, is the following summarization from a recent paper by Dr. Merrill E. Champion:

> "On looking back over the history of communicable disease in this State and the progress made in its control, certain things strike one at once. One is the virtual disappearance of smallpox in Massachusetts. No case has been reported in this State since 1932. It is reasonable to conclude that this result is due in large part at least to the fact that we have had for many years a law requiring vaccination of all children about to enter school. Unquestionably another factor has been the excellent vaccination practices of surrounding states.
>
> "Diphtheria, too, is a disease which has shown a startling diminution during the years that have elapsed since the creation of the State Department of Health. In 1915 there were 9,282 cases of diphtheria in Massachusetts with 720 deaths. In 1943 there were 140 cases of diphtheria with 11 deaths.
>
> "Typhoid fever in 1915 occurred in 2,204 cases with 246 deaths. The corresponding figures for 1944 were 32 cases and 1 death. On the other hand, it is only fair to say that some of the other communicable diseases follow a regular course with relatively little difference in the incidence from decade to decade. These are the diseases for which we have no specific preventive or treatment. As an example, one may mention measles of which 22,881 cases occurred in 1915 and 35,098 in 1943.
>
> "This Department of Public Health like all others is still hoping for a feasible method of detecting those who are susceptible to poliomyelitis and for an effective treatment for this much feared disease. We have not yet discovered how to prevent meningitis although great advances have been made in the treatment of this disease. We have not yet been able to get the general public sufficiently health conscious to make possible the carrying out of various health procedures which we do know about. This is only another way of saying the State Department of Public Health and local boards of health as well as all private agencies interested in the promotion of public health still have plenty of room for expansion."

BENCH MARK 1936

New Functions Meet New Needs

Our last bench mark has two bases. One is a state activity, the other federal. This year saw the publication of the Report of the Special Commission to Study and Investigate Public Health Laws and Policies, a document which still in-

fluences the entire course of public health administration throughout the Commonwealth. Social Security, too, perhaps in a more tangible way, is fostering a broader program. So, it seems especially appropriate that we take our last bearings at this point.

The Report of the Special Commission is a remarkable document, the product of the painstaking study by the leaders of the profession. Its proposals deal with the whole range of urban and rural health administration by state and local agencies. In the depth of its research and the cogency of its proposals it is a fitting complement to the report of that First Special Commission, the famous Shattuck Report of 1850. Some of its recommendations for the betterment of local health administration have been made possible by federal grants through Social Security.

> The broad intent of the Social Security Act is stated in its preamble:
> "To provide for the general welfare by . . . enabling the several states to make more adequate provision for aged persons, dependent and crippled children, maternal and child welfare, public health. . . ."

Specifically, the Act provides grants to be made to the states to aid maternal and child welfare activities, and for public health work generally, featuring aid in the development and maintenance of state and local services—among many other activities.

Charged with the administration of health provisions of the Act, the Federal Public Health Service determines the conditions under which grants to the states may be used in establishing and maintaining statewide and local health services. The regulations setting forth the type of community program for which financial aid might be expected were promulgated at the time of the Act's passage, and were approved by the Conference of State and Territorial Health Officers. Under the accepted plan, aid for local health services could be given *only* when the public health program of the city, county or district was under the direction of a full-time health officer. In addition, there should be such medical assistants, public health nurses, sanitary officers and clerks as would insure at least a minimum of effective health administration. Unfortunately, the communities in the Commonwealth with full-time health personnel and therefore eligible for Social Security allotments could be counted on one's fingers. By and large, these were the communities that least needed the aid which might be forthcoming from this source.

Throughout the State most of the towns still were served by a board of health composed of public spirited citizens who employed an agent, usually on a part-time basis, who might be assisted by the whole or part-time services of a public health nurse and a sanitary inspector. With the exception of the ten larger municipalities and one or two combined districts—at which we propose to look in a moment—local health administration in Massachusetts was in 1936 essentially at the same level of development that it was when Walcott guided the destinies of the Commonwealth's health administration in the "golden era."

Weaknesses in local health organizations had long been apparent to leaders in the field of public health. Earlier attempts had been made to remedy the most obvious defects, and a law permitting the voluntary joining of communities to form a combined health unit had been passed. One fault of the law lay in the fact that communities might join and leave such associations at will, a condition which precluded the possibility of assuring continuity of service and tenure

of employment, which would make for competent administration. Despite the limitations of the law, there were instances in which communities had united to permit joint health services, but this did not alter the situation generally, which was one of serious weakness insofar as suburban and rural health is concerned. However, the Social Security funds did extend the life of these State-aided, combined health units.

Nashoba and Southern Berkshire Demonstrations Helped

For twenty years it had become increasingly apparent that the organization of local health activities was greatly handicapped by the inability of small political units to employ trained, full-time public health workers. As has been mentioned, towns had joined to provide for special public health services, by competent personnel, and it seemed logical that more completely functioning health units might be encouraged. In order to give this idea a satisfactory trial, the Commonwealth Fund of New York was invited to subsidize a five-year demonstration of town unions in rural areas in Massachusetts. With funds assured, one union was organized in Southern Berkshire County and another in the Nashoba Valley District of Middlesex and Worcester Counties. At first the health services were provided without expense to the towns. At the end of three years, when the communities were asked to begin a partial support of the program, the districts had to be reduced in size, for a third of the towns refused to contribute even a part of their proportionate share of the support of the unit and consequently withdrew. By the time the Commonwealth Fund demonstration was completed, Federal allotments through the Social Security Act providentially became available and the demonstration was enabled to continue for a further trial. Later the Southern Berkshire District had to be disbanded because additional towns could not be induced to join it and the population then served was insufficient to make the unit self-supporting. The Nashoba Valley District continued to function but with only ten towns having a total population of 17,000, until the wartime shortage of medical officers resulted in the inability to fill the position of medical director. On a restricted basis the union continues without a medical officer, even though the subsidy was withdrawn.

The only joint service on a county-wide basis which has persisted despite the weaknesses of the permissive State law is the Barnstable County Health Department on Cape Cod. Serving a relatively small population, this agency was never able to carry out a full administrative program, but the advent of Federal funds through the State Department did permit an increase in the services which it renders to the towns of Cape Cod. Despite the new financial support, the county unit stumbles along because the town boards of health retain all their powers except those they willingly delegate to the unit and because they employ personnel independently of the county unit they must decide each year, whether to remain within or to leave the administrative union.

Though the Social Security Act may have accomplished less in the improvement of Massachusetts local health administration than its sponsors hoped—largely because Yankee love of autonomy conflicts with desire for competent full-time administration—the Act did implement an immense increase in the volume and variety of services rendered to the Commonwealth by the State Department of Public Health. Some measure of the influence of the Social Se-

curity Act may be gained from glimpses of the activities of the various divisions of the Department undertaken in the years following its passage. To Massachusetts came new funds equal to about half the total public health budget of 1936—exclusive of the support of the tuberculosis and cancer hospitals.

Child Health Services Markedly Expand

In the Child Hygiene Division the professional staff was doubled. Where one well child conference unit had tried to cover the State previously, two now were made available. The well child conference unit was increased to comprise a pediatrician, a public health nurse, a dental hygienist, and a nutritionist. This team of professional people visits designated communities in the State to give a practical demonstration of the complete infant and preschool program. In anticipation of the team's visit, the public health nurse of the district enlists the support of a local committee which arranges for the pre-conference publicity, provides transportation of families to the clinic and generally holds itself responsible for the attendance. For both the child and his mother the conference is a unique experience and the community enjoys a continuing benefit, for the local nurses are charged with the duty of following-up the findings of the clinic team. They seek to have physical defects corrected, and enlist professional support in curing faulty habits. Most important of all, by this practical means, the town is led to see the need for locally conducted well child conferences, the local committee being responsible for the continuance of the service. Thanks to the new funds, twice the number of communities profit from these demonstrations.

It is manifestly impracticable to tell in detail of all the augmented administrative activities of the Division of Child Hygiene. They are, however, three projects which demand our attention at this point in our history. The first of these was an attempt to find a complete plan for testing the eye and ear functions of young children in order to overcome learning handicaps. A new testing mechanism, adapted for children, was evolved and the results of this project are so satisfactory that the approval of the Massachusets Vision Test was given by both the Public Health Council of the Department and the Council on Physical Therapy of the American Medical Association. Its introduction into the schools of the State followed, and it is finding its way into institutions throughout the country, even to the United States Army and Navy. Following the vision testing studies have been made of children's hearing, and the outcome of these studies has been the development of tests which are still in process of standardization. These two tests should go far toward removing remediable handicaps in young children.

The second project was a new service. The marked decrease in infant deaths focused attention upon premature births which remained one of the unsolved problems of infant mortality. Concerted attack upon the problem led to an immediate reduction in the rates which promises to be lasting. In each of forty-eight centers in the Commonwealth, hospital facilities for the immediate care of prematurely born babies were established and an ample equipment of warmed carrying baskets was made available through local boards of health. Public health nurses then demonstrated that any "premie"—anywhere in the State—could be carried without delay or exposure from home to hospital.

The last of these new activities is a joint service carried on by the Depart-

ment of Public Health and of Education. A School Health Council composed of the Commissioners of Public Health and of Education and of certain members of their staffs was created and charged with the effort to improve school health programs. This heart-warming example of productive collaboration between two State Departments is especially worthy of note. Federal funds permitted the employment of a trained staff to carry out an ambitious health education program looking to the preparation of teaching units in the elementary and secondary schools. The workshop method was adapted to the health field and by it teachers were induced to evolve practical programs to meet the particular needs of their own classrooms.

Adult Hygiene Evolves Educational Techniques Cancer control activities celebrated a tenth anniversary in 1936, the first clinic having been opened a decade earlier. In this and the others which had been organized in rapid succession to offer diagnostic facilities, a novel educational program was begun when Social Security funds became available. Its objective was to give exact knowledge to individuals gathered in small groups to be addressed by an authority in the person of a local practicing physician. To make this plan a reality in a state of more than 350 communities, having a total population of nearly four and a half million, and served by more than seven thousand physicians, was no mean task. In each town—or city neighborhood—a committee composed of representatives from every local organization was formed. The recruiting of the committees was done by the personnel of the Division of Adult Hygiene. These committees differ from most local health councils chiefly in that they are not selective or limited to groups or classes, but represent every level of interest in the community—religious, service, political, labor and racial groups. Each club or association represented on the committee is asked to agree to devote one meeting a year to a talk on cancer. A local physician is asked to be the teacher in this program because the early detection of cancer is in his hands. He knows the community in which he lives and it is the duty and right of a physician to teach.

Tuberculosis Preventive Services Rounded-Out Looking always to the control of tuberculosis, construction of State, county and municipal sanatoria proceeded steadily after the establishment of the Rutland Sanatorium until Massachusetts enjoyed the distinction of being numbered among the few States which could furnish nearly three beds for each annual tuberculosis death: authorities in this field having set two and one half beds per annual death as the objective to be attained. When one of the two sanatoria devoted to the care of tuberculous children during the Chadwick clinic program was found to be no longer needed for that purpose, Westfield Sanatorium was rebuilt and facilities for treating adults for both tuberculosis and cancer were provided in the new building. The long hospitalization required for patients with extra-pulmonary forms of tuberculosis as well as their special needs had made them step-children at the established sanatoria and unwelcome guests in general hospitals. On the recommendation of a special commission, Lakeville Sanatorium was therefore converted into a hospital exclusively for the treatment of these patients. So, at least, the modern treatment of tuberculosis in all its forms was fully available. Later the Department was authorized by the legislature to admit cases of infantile paralysis to the Lakeville State Sanatorium.

Another pioneering activity of the Department is the hospitalization of a limited number of patients with chronic arthritis. For a number of years the demand had grown for a new State hospital to be devoted solely to the care of medically indigent rheumatic patients. At the suggestion of the Department, and in response to this demand, the legislature authorized a study of the whole problem of the prevention and treatment of chronic arthritis in one of the large metropolitan hospitals. The Department, then contracted with the Massachusetts General Hospial for the care and study of not over twenty patients at a time. Besides furnishing treatment for a substantial number of medically indigent patients, this project is providing invaluable findings on which to base further measures for the prevention and treatment of this most disabling of chronic diseases.

Control of Venereal Disease Achieves Divisional Status

The year 1936 was marked by an event of far-reaching import to the campaign for the control of the venereal diseases. An article by Surgeon General Thomas Parran, U. S. Public Health Service, entitled "Why Don't We Stamp Out Syphilis?" appeared in a popular magazine. This challenging question lifted the lid of censorship that had so long been clamped upon any discussion of the venereal diseases outside the scientific press and aided greatly in speeeding up state programs everywhere including that of the Massachusetts Department of Public Health. Here, the venereal disease control services were changed from a sub-divisional status under Communicable Diseases, and the Division of Genitoinfectious Diseases was established.

Social Security funds permitted an immediate expansion of all activities, and efficient full-time case follow-up for the clinics—which had previously had only part-time service or none at all—was typical of the changes effected. Clinics and practicing physicians were supplied with arsenicals and the heavy metals (more recently the sulfonamides and penicillin were added). Treatment centers were improved and new ones organized as experience indicated their need, and the General Court amended the law to permit the State Department of Public Health to support existing clinics for the treatment of venereal diseases. Though the estimated total cost of treatment and services for syphilis and gonorrhea under this plan reached two-hundred thousand dollars a year, the financial burden could now be assumed by the Commonwealth.

Patients no longer had to be identified to local boards of health in order to receive free treatment. It was also possible now to employ an epidemiologist—"female"—to give full-time attention to the follow-up for syphilitic pregnant women. Educational work was greatly accelerated, new literature was made available for distribution, and a lecture service was organized and radio broadcasting stepped-up. In anticipation of the Selective Service Act, plans were made with the U. S. Public Health Service and the military and naval authorities to meet the emergency involved in the military training of the National Guard and the civilian units at training camps throughout the Commonwealth. For the first time all selectees were examined serologically for syphilis and as a result of these tests, Massachusetts was found to have the second lowest syphilitic rate in the country. All infected men were followed-up to see that they received proper treatment.

Crippled Children, Hospital Licensure, E. M. I. C., Et Al

The variety and complexity of the independent activities undertaken by the Department of Public Health since the passage of the Social Security Act reflect in some measure the administrative burdens which present-day public health practice is imposing upon both State and municipal health departments. Simply to list a few of the State Department's new activities—services for crippled children, hospital licensure, dental research and the Emergency Maternity and Infant Care Program—will suggest even to the casual reviewer something of the versatility which the modern health administrator must possess.

Social Security funds enabled the Department of Public Health to expand and improve the limited services for crippled children which had been given since 1925 at the Lakeville Sanatorium. The new services could not be placed on a statewide basis and the definition of a crippled child was broadened so that practically all physically handicapped children who are medically indigent could be cared for. As the Department could not successfully carry out such a program of medical care without the active and sympathetic participation of the practicing physicians of the State, detailed plans for this service were presented to each of the district medical societies throughout the Commonwealth. Though this procedure took several months, it was well worth the effort and the time, for it earned the good will of the members of the Massachusetts Medical Society.

Physiotherapists and Social Workers Assigned to Districts

The first clinic center for crippled children was established at Pittsfield late in 1936 and before the year was out ten others were under way. During this developmental period, all activities of the field staff were supervised administratively and technically by the central office. As a result, these highly specialized services were rendered independently of other activities of the Department. Consequently, the staff of "Crippled Children" often were unaware of other departmental activities and many of the State Department's other professional workers did not know what was being done for crippled children. More important still, the children themselves and their families did not receive the assistance of other departmental specialists such as public health nurses and nutritionists. This condition was corrected as soon as the health districts were reorganized, when the field staff of the Services for Crippled Children was transferred to these district units so that complete care of the crippled child became an integral part of departmental activities.

More than three thousand children have been accepted for care, nearly two-thirds of whom have been discharged because their crippling condition had been removed or improved, or because they had reached the age of twenty-one. There are now in excess of eleven hundred children on the active list and this number seems to have reached an equilibrium, the number of children discharged being about equal to the number admitted each year. Appliances have been liberally provided and all needed physical therapy treatments have been given. The children under the care of the service have had the unlimited aid of the public health social workers. As a result of this effort, and the work of the many non-official agencies rendering aid, no handicapped child need go untreated. Ample resources are available for the care of every needy child. Vigorous effort is made to locate untreated crippled children but few are now being found.

Medical Social Service Prospers

The growth of medical social service in the Department tells its own story. In the dim past when Chamberlain-Kahn funds were briefly available for venereal disease control activities, one medical social worker had been rather gingerly employed. The value of her services was so evident that she stayed on when Federal funds were no longer available. Then, when Dr. Bigelow became Commissioner, he appointed a supervisor of social service directly responsible to him—his goal, apparently, to develop a general service available to any division whose director might have the foresight to use it. The new supervisor began her work in the field of cancer, which was then being cultivated to meet the social needs of the patients in the State-aided clinics, and as the first fruit of her effort, a full-time, resident social worker was appointed for the Pondville Hospital. A year or two later we find two assistant social workers assigned to help meet the needs of this institution.

Next, tuberculosis was to visualize the need of social service. Concerned about the long lists of patients awaiting admission to sanatoria, and particularly the number of persons seeking readmission, the Director of the Division asked for a social worker to assist with the solution of these problems in tuberculosis control. Two had been appointed in 1929. But it was at the time that State aid for crippled children was organized that the liveliest need for social service became fully evident. At first, only two qualified workers could be found; now there are many. Curiously enough, the most recent use of social services in a field where the need has long been felt seems to have been in one of the longest established projects, the child hygiene program. One worker was appointed in 1940 to survey the social needs, to consult with the local nurses and nursing agencies, and to participate in the teaching program. The point to be noted is that up to this time medical social service had been offered on a specialized basis. Then a radical change was made; all social workers except those in the institutions were officially assigned to the district offices for generalized service.

Space permits only a sampling of the variety of functions of the Dental Hygiene Bureau. Oral hygienists inspect the teeth of preschool children at the well child conferences; school surveys to show dental deficiencies are made upon request; lectures on dental health are given at all State teachers colleges, at the Tufts Dental College and Harvard School of Public Health. More recently the Dental Hygiene Bureau has numbered among its diverse activities licensing of dental clinics, the Victory Dental Corps Program—which has promoted dental care for "high schoolers" during wartime—and the beginning of a five-year study of the result of the topical application of fluorine to children's teeth. As an example of the strange combinations which intradepartmental cooperation may induce, we find the sewage experimental station staff collaborating with the oral hygienists. For, parallel with the Dental Bureau's study of fluorine, the Experiment Station has developed a chemical water analysis for fluorine which requires only about 5% as much time as other methods. This test will make it possible for the Department to contribute its help to research if fluorine continues to arouse as much scientific interest as it does at present.

Public Health Nursing Systematized

Through the years public health nursing suffered a Topsy-like growth. In the early days, nurses—usually called health educators or assistants to the district health officers—were employed by one division or another as the need became apparent.

Some hint of the variety of activities which, in one way or another, became a part of public health nursing in the early days may be caught in the reminiscent comment of Miss M. Gertrude Martin, R.N., who alone of the original eight assistants to the district health officers appointed in 1918, remains in the Department. In their districts the public health nurses promoted the Department's many faceted communicable disease program through their inspired educational efforts. They knew their communities, and from their knowledge they formulated practical programs of generalized nursing service. They knew the nurses of their communities too, and visited with them in the homes, reviewing with them their achievements and problems. When "health weeks" were called for, the district nurses did the "leg work"; they arranged exhibits, gave talks, and saw to it that the press did not allow the "week" to go unnoticed. Well child conferences, tuberculosis diagnostic clinics, diphtheria immunization clinics and the like, all made their demands upon the "willing and able" services of the Department's public health nurses.

When the legislature handsomely opened the public purse for health work in the early twenties, the State was districted for public health nurses but their assigned areas bore little relation to the territories of the health officers. The nursing districts became smaller and smaller as the nurses increased in number, but this type of organization left much to be desired from the point of view of efficiency. When Social Security funds became available the entire district administration was reorganized. The nursing staff increased to seventeen, of which eight supervisory nurses were assigned to the district health offices and a generalized nursing service undertaken.

Hospitals Are Licensed

Soon after the legislature enacted a law authorizing the Department to license hospitals and sanatoria, an Advisory Committee consisting of practicing physicians, hospital administrators and trustees was appointed. With the aid of this committee, regulations for the various phases of hospital management were established which, with the rules of the State Department of Public Safety, have done much to improve conditions under which the hospitals of the State are conducted. No hospital is licensed until it has been inspected by the Department representatives, certified by the local board of health as suitable, approved by the Department of Public Safety from the standpoint of accident hazard and fire protection, and by the Division of Sanitary Engineering of the Department of Public Health from the standpoint of water supply and sewage disposal. One of the beneficient results of this program has been the closing of a number of institutions which were entirely unsuitable for hospitals, or their conversion into nursing homes. In other instances hospitals which most surely would have been unfit have been prevented from opening. At the same time, it has been possible to encourage the establishment of hospitals where they were needed in communities otherwise without such facilities. All out-patient departments and clinics associated with hospitals are similarly inspected and licensed by the Department.

Physicians and Department Collaborate for E.M.I.C.'s Success

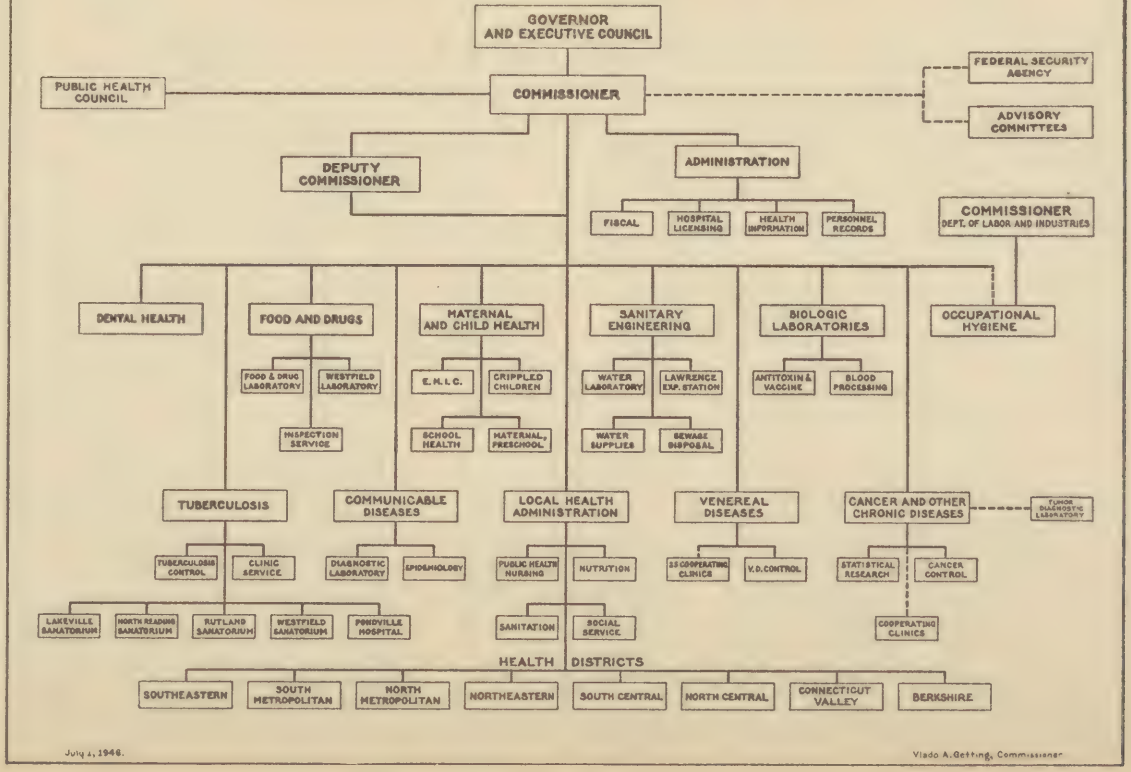
Certainly not least in its potentialities for far-reaching consequences—though listed last—is EMIC. Emergency Maternity and Infant Care, as planned by the Division of Child Hygiene and in conformity with the rules and regulations of the Children's Bureau of the United States Department of Labor, includes free prenatal, delivery, hospital, and postnatal care for the wives and infants of servicemen in certain pay grades. Throughout its history, the Division of Child Hygiene had meticulously limited its activities to guidance of parents of well children, studiously avoiding all matters of medical diagnosis and treatment, but now the Division found itself almost overnight deep in the ramifications of public medical care. The decision to adopt this program precipitated on the Department an avalanche of applicants. For the first week it took practically the entire time of all the staff of the Division of Child Hygiene, just to answer the questions of applicants who came to the State office in person. For the first month hundreds continued to come—many prospective mothers applying personally, accompanied by husbands in uniform. Indeed, so many in the last days of pregnancy continued to appear that an emergency obstretical kit was kept handy in the Division office. During the first thirty days more than two thousand applications were received, and during the first year a level of more than fifteen hundred per month was maintained steadily. Approximately two thousand physicians and one hundred and thirty-three hospitals in the Commonwealth cooperated in this program during its first year. Two technical committees—one in pediatrics and one in obstetrics—are given assistance of the greatest value not only in the formulation of this program but in directing its policies.

Local Health Administration—Newest Child of Departmental Family

The last change in departmental organization, which the Federal grant made possible, is the establishment of a Division of Local Health Administration. This Division is the inevitable outcome of the growth of the field activities of the Department. Through the years of growth each of the divisions employed more and more field workers who went about independently into local communities, each responsible only to his own division director. Often the district health officer had not even known of the visit. Sometimes local communities had found themselves in that distressing dilemma in which one State worker had recommended one mode of action and another had recommended a conflicting method. This unhappy situation was relieved when steps were begun to assign field personnel to districts and to place them under the supervision of the district health officer. In 1943 this realignment was accelerated and all eight districts were reorganized with administrative, professional and clerical staffs—all responsible to the Division of Local Health Administration.

A new position, that of district sanitary officer, was also made possible by Social Security funds. His duties are to work directly with local boards of health and local inspectors on problems of environmental sanitation—refuse and garbage disposal, private water supplies and private sewage treatment, milk sanitation and the inspection of eating places. As soon as appointments can be completed, district sanitary officers will be assigned to each of the eight health districts.

MASSACHUSETTS DEPARTMENT OF PUBLIC HEALTH ORGANIZATION



July 1, 1948.

Vlado A. Getting, Commissioner

In the realignment of the health districts, several factors were taken into consideration; among them, total population in communities over 25,000, local health facilities, lines of transportation and area in square miles. The district health officers are assisted by a basic professional and clerical staff consisting, in general, of a public health nursing supervisor, an infant welfare field nurse, a sanitary engineer, a sanitary officer, a physiotherapist, a medical social worker, a public health education worker, a nutritionist and several clerk-stenographers. The district health officer, as representative of the Commissioner, is responsible for the entire program of the Department in his district. Who will challenge our assertion that this community localization of State health services is the most efficient, and should prove the most potent, influence for improving local health department programs?

The story of today is tomorrow's history. This recounting of the long years of service rendered to the Commonwealth by the Department during its three-quarter century of life, would not be complete without some final comment upon its present activities. Anyone who has followed this story to this point, and who is at all familiar with public health administration can create his own picture of the Department at work today by glancing at the accompanying organization chart.

The organization chart testifies to the diversities of the day-to-day activities of the State Department of Public Health, but broad as is the coverage of its services, simply to list all the divisions and bureaus fails to picture the unusual functions which the complexity of modern living has placed at the door of the Department.

A comparison of the two charts—1915 and 1946—indicates some of the changes made in the organization of the Department. Since the time of the reorganization of 1915, its activities have more than doubled. New officers were appointed and new divisions created from time to time without complete coordination of their activities, and with the passage of the years arrangements originally beneficial have proved no longer of value, so it became necessary to alter these relationships. It seemed wise to change the names of some of the divisions, as will be noted in the charts.

Sanatoria and Tuberculosis Merely to name the five great hospitals which the legislature placed under the direction of the Division of Sanatoria and Tuberculosis is sufficient to portray the extent of the administrative obligations imposed upon this Division. But it performs many more services to the Commonwealth than these administrative activities. Conspicuous among them are the mobile and portable X-ray units, by means of which industrial employees, high school students and teachers—among other groups—are given chest X-ray examinations. More than one hundred thousand persons are given the benefit of these examinations each year. Although many active cases of tuberculosis are found through these industrial surveys, many tuberculous persons so found refuse sanatorium care because of wartime demands for labor and the temptations of high wages. These people injure themselves, their families and their associates. Follow-up services to persuade reluctant patients to care for themselves and to induce persons in contact with open cases to protect themselves are some of the collateral activities growing out of the industrial services.

Administration Under the Division of Administration are two bureaus which are essentially new in their present programs. In the Bureau of Health Information are centralized all the diverse activities which go to make up the present day public health education program. In addition to the preparation of the accepted visual aids which state departments employ in health promotion, the Bureau has initiated health education programs in junior and senior high schools when this promotional service has been requested. In addition to the usual services which a health library carries out, the Department library—which is a part of this Bureau—acts as an agency for supplying new and unusual material to the district offices.

The Hospital Licensing Bureau has extended its inspection and licensing function of dispensaries and clinics as well as to the hospital, for the improvement of which this Bureau was originally created.

Biologic Laboratories Celebrating its fiftieth anniversary in conjunction with the Department's seventy-fifth, the Division of Biologic Laboratories enters now upon its second half-century of service, continuing to produce its familiar list of biologics even though military demands have curtailed its personnel. In addition to the manufacture of vaccines and serums for physicians and institutions of the State, the Laboratory plans to undertake the important function of processing blood and providing plasma and fractions of plasma, which war experience has shown to be of such great preventive and therapeutic value.

Cancer and Other Chronic Diseases The new divisional designation is a more realistic name than "Adult Hygiene" by which this Division was called. In addition to the State cancer clinics, which continue to enjoy an increasing attendance from year to year, and the tumor diagnostic service which also grows in scope, the Division has undertaken a series of cancer symposia in different sections of the State—the first project of this kind to be carried out on a local basis in the United States.

The effect of the fifteen-year old cancer preventive program may be measured by the average interval between the onset of the first symptom of cancer and the first visit of the patient to the physician. Twenty years ago the interval between onset and first visit was over six months. Today it is three months. The thesis of this division is that the interval can, and will, be further reduced when the public is led to accept the teaching that the sooner the doctor can give treatment, the better is the chance of cure.

Local Health Administration Youngest of all the Department's family, having been created in May of 1944, is Local Health Administration. Some measure of the complexity of its activities will be gained from a review of the recent organization chart. Not only is this Division charged with the administration of the eight district offices, but it is responsible for the five bureau activities of Dental Health, Public Health Nursing, Nutrition, Social Service, and Sanitary Inspection.

The activities of the Nutrition Bureau are concerned with the giving of advice to local nutritionists, but in addition assistance is given to municipalities for the improvement of school lunches, nutritional education programs and the training of new workers.

Generalized public health nursing has long been the goal of Nestors of public health, but the generalized medical social service program of the Social Service Bureau is unique. The State Department's experience has revealed that the results achieved by the medical social worker can be greatly enhanced through the cooperation of other staff members of her district. Local health and social agencies call for the services of these workers whose interests cut across such divisional activities as tuberculosis, crippled children services, maternal and child health, cancer and venereal diseases.

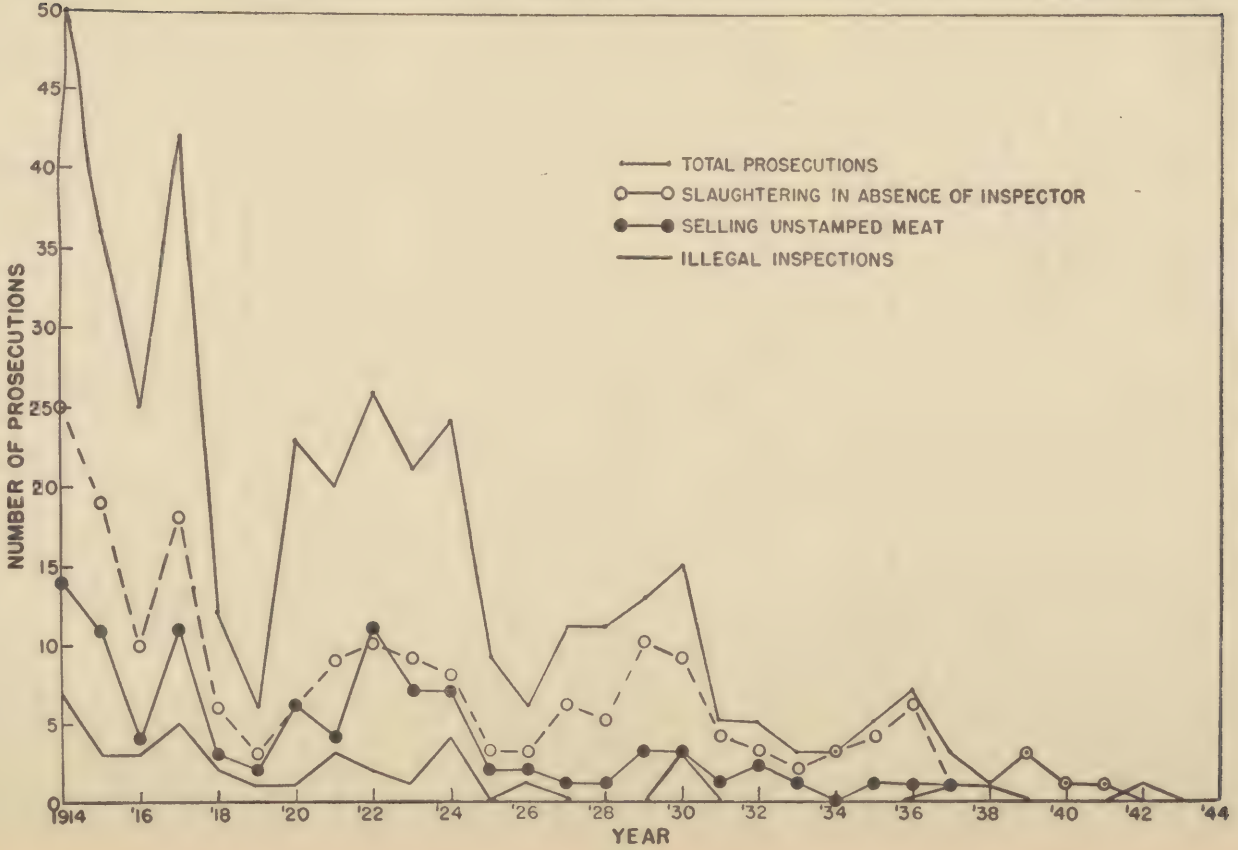
Venereal Diseases To its conventional tripod—clinic service, casefinding and education—the Venereal Disease Division, newly released from "Genitoinfectious Diseases," has undertaken promising ventures in the field of research. Penicillin is distributed to the cooperating clinics and certain hospitals throughout the State. Standards of treatment with the new drug for both gonorrhea and syphilis have been promulgated and a study of the collected experience of the several agencies should add to our knowledge of the therapeutic value of penicillin. Gonococcal culture service also is extended to all physicians in the Commonwealth.

Communicable Disease In addition to the continuing epidemiologic aid to local boards of health which the name "Communicable Disease" implies, the division, handicapped as it has been by the loss of professional personnel to the armed services, has carried on two noteworthy activities. One has been the laboratory approval program by which local laboratory performance throughout the State has been greatly improved. All laboratories which examine specimens from cases of communicable disease may come voluntarily under this supervision. Associated with this as a collateral activity is the establishment of refresher courses for laboratory technicians; the course being given at the Pratt Diagnostic Hospital and supported by the Commonwealth Fund. Each year twenty students selected by the Division receive this training, and this program, too, has done much to improve laboratory performance.

Maternal and Child Health The change from the earlier name of "Child Hygiene" to that of "Maternal and Child Health" makes the title descriptive of the broad program of this division. E.M.I.C. is but one of the newer activities. In less than a year and a half fifteen thousand applications for maternity and pediatric care were processed, and by the end of the year 1944 over a million dollars had been expended in the Commonwealth for the care of wives and children of servicemen.

Services for Crippled Children, recently transferred to the Division of Maternal and Child Health, continue to increase in volume and effectiveness. The outbreak of anterior poliomyelitis was responsible for part of the current increase, but much is due to the continuing search throughout the State for children needing care. The field staff for Crippled Children Services, consisting of six physiotherapists, a supervisor of public health nursing, a supervisor of speech therapy, the part time of six public health social workers, gave a total of over thirty-five hundred treatments and made over forty-three hundred visits pertaining to the welfare of these patients.

PROSECUTIONS FOR VIOLATION OF MASSACHUSETTS SLAUGHTERING LAWS



Sanitary Engineering The mention of the words "environmental sanitation" visualizes enormous numbers of water examinations completed, inspections of water and sewage treatment plants made, and stream surveys to detect pollution carried on throughout the State. But the present-day program of the Division of Sanitary Engineering covers a far wider range. Plans are approved for new water supplies and sewage disposal plants. The Division, among a host of other activities, investigates offensive trades, collects water samples from bathing beaches in the Metropolitan area, inspects waters where shellfish are grown, approves or prohibits the taking of shellfish from coastal waters depending upon whether they are safe or polluted. The oldest Division continues among the leaders in volume of services rendered.

Food and Drugs Examinations of samples of milk, food and drugs, and the sanitary inspection of bakeries, soft drink plants, ice cream factories and pasteurizing plants, are the type of service one anticipates of the Division of Food and Drugs. It does all these well, but it carries on a wide variety of other examinations. The days are none too long to find time for court cases, dissuading venturesome souls from endangering health and life, and protecting the public from human carelessness. Among its unusual activities is the biological assay of Vitamin D in milk and of other vitamins in a variety of foods and drugs. That a goodly proportion of samples examined is still found deficient in the claimed vitamin content is an indication of the need for this venture in food and drug control.

Although this story may seem to the reader unnecessarily detailed, no written account, however long, can do justice to the work of so wide-ranging an agency as the Massachusetts Department of Public Health with its fifteen hundred employees scattered from Barnstable to Berkshire. Really to know the Department it is necessary to "come and see" it. That is the invitation that the Department extends to all who collaborate with it.

APPENDIX I

EXCERPTS FROM:

REPORT

of a

GENERAL PLAN

for the

PROMOTION OF PUBLIC AND PERSONAL HEALTH

Devised, Prepared and Recommended

by the

COMMISSIONERS

Appointed Under a

Resolve of the Legislature of Massachusetts

Relating to a

Sanitary Survey of the State

Presented April 25, 1850

Boston:

Dutton & Wentworth, State Printers

No. 37, Congress Street

1850

Report of the Commissioners

The Commissioners appointed on the third day of July last "to prepare and report, to the next General Court, a plan for a Sanitary Survey of the State, embracing a statement of such facts and suggestions as they may think proper to illustrate the subject," have considered the matters referred to them, and submit their Report.

We believe that the conditions of perfect health, either public or personal, are seldom or never attained, though attainable; that the average length of human life may be very much extended, and its physical power greatly augmented; that in every year, within this Commonwealth, thousands of lives are lost which might have been saved; that tens of thousands of cases of sickness occur, which might have been prevented; that a vast amount of unnecessarily impaired health, and physical debility, exists among those not actually confined by sickness; that means exist, within our reach, for their mitigation or removal; and that measures for prevention will effect infinitely more, than remedies for the cure of disease.

But whom does this great matter of public health concern? By whom is this subject to be surveyed, analyzed, and practically applied? And who are to be benefited by this application? Some will answer, the physician, certainly. True, but only in a degree; not mainly. It will assist him to learn the causes

of disease; but it will be infinitely more valuable to the whole people. The people are principally concerned, and on them must depend, in part at least, the introduction and progress of sanitary measures.

In a subject of such vast importance, on which so little is generally known, and so much ought to be universally known, and which is so full of interesting and useful illustrations, it is difficult to confine ourselves within the limits of a single report of reasonable length. Yet, in our judgment, it would be unworthy of Massachusetts, under whose authority we act, and it certainly would be unsatisfactory to ourselves, if we failed to make the attempt, at least, to present the subject so that the people of the state may know what we mean; so that they may be able, if they choose, to carry our recommendations into practical operation; and so that, if thus applied they will add to their physical power and increase their intellectual, social, and personal happiness.

It should be born in mind, however, that this report is designed to suggest a plan for a sanitary survey of the state, and not to contain the survey itself. We were authorized, however, by the resolve, to embrace a statement of such facts and suggestions as we might think proper to illustrate the subject. We have accordingly been at no inconsiderable labor and expense to obtain the most recent authentic information concerning the history and present condition of the sanitary movement; and we shall proceed to give some of the results of the investigation, before presenting our plan for a sanitary survey of this state.

The Sanitary Movement at Home

Sanitary Police. Some historical notice of the sanitary legislation of Massachusetts seems proper, preliminary to any statements of its present condition. The subject seems to have received little attention from the General Court, during the old colonial charter. Two acts, which have some relation to it, we shall presently notice. Laws were passed by the provincial government, relating to nuisances, drainage, smallpox, and some other matters; many of which were special acts, or partial in their operation. But though imperfect, they are honorable to the state, and exhibit the care which the Legislature has ever wished to exercise over the people. To them we have been indebted for many excellent sanitary municipal regulations which have continued until the present time.

Nuisances. In 1692 and 1708, acts were passed, providing that "in Boston, Salem, Charlestown, respectively, and other market towns in the province," "slaughter-houses for killing of meat, still-houses, and houses for the trying of tallow, currying and dressing of leather be assigned by the selectmen to places where it may be least offensive," and prohibited elsewhere. The Revised Statutes modified this act, and extended its provisions to any town in the state, at the option of the selectmen, and included "any trade or employment offensive to the inhabitants, or dangerous to the public health."

Drainage and Sewerage. In 1702, an act was passed providing "for appointing commissioners of sewers, for the draining and removing of the banks and obstructions of the passage of waters in rivers, brooks, or ponds that occasion the overflow and drowning of meadows and low lands; and also for the draining and flowing of swamps and other unprofitable grounds, and drying of them."

Sickness. Legislation on this subject, principally with reference to the smallpox, has been frequent in the history of the State. As early as 1701, "an act providing in case of sickness," was passed, "for the better preventing the spreading of infection."

Quarantine. In 1700, the masters of ships were required to furnish a list of all passengers to the selectmen of towns, and give security for the support of any "impotent, lame, or infirm person" who might be discharged. At a subsequent period, not exactly known, a hospital was erected on Spectacle Island, by the town of Boston; in 1799 the whole quarantine regulations were transferred to the Boston Board of Health; and there it rested, as it always should have done, until the Revised Statutes were passed.

(After reviewing a tragic century of epidemics of smallpox, cholera, scarlet fever, typhus, and yellow fever, all of "uncommon malignity" this section concludes with these paragraphs:)

It is proved that causes exist in Massachusetts to produce premature and preventable deaths, and hence unnecessary and preventable sickness; and that these causes are active in all the agricultural towns, but press most heavily upon cities and populous villages.

It is proved that measures,—legislative, social and personal,—do not at present exist, or are not so fully applied, as they might be, by the people, for the prevention, mitigation, or removal, of the causes of disease and death.

It is proved that the people of this state are constantly liable to typhus, cholera, dysentery, scarlatina, smallpox, and the other great epidemics; and to consumption, and the other fatal diseases, which destroy so many of the human race in other parts of the world.

It is proved that the active causes of disease and death are increasing among us, and that the average duration of life is not as great now as it was forty or fifty years ago.

Plan for a Sanitary Survey of the State

We now proceed to give an outline of a plan for the Sanitary Survey of the state which we propose for adoption.

Our plan consists of a series of measures, which may be rendered permanent if desired, presented in the form of separate recommendations. They are divided into two classes, and are to be regulated and controlled by the agencies which are proposed to be established; one by the legislative authority of the State, and the municipal authorities of towns and cities, and the other by social organization and personal action. Some of these measures are of great magnitude, and would each furnish matter for a volume, if fully explained and illustrated. All we propose to do in this connection is, to name and define each, and to give a brief explanation and illustration of its character and design. These measures, it must be recollected, however, are only a series of plans by which a sanitary survey might be carried forward. The accompanying information is inserted merely to illustrate these plans.

State and Municipal Measures Recommended

We recommend that the laws of the state relating to Public Health be thoroughly revised, and that a new and improved act be passed in their stead.

We recommend that a general Board of Health be established, which shall be charged with the general execution of the laws of the state, relating to the enumeration, the vital statistics, and the public health of the inhabitants.

We recommend that the Board, as far as practicable, be composed of two physicians, one counsellor at law, one chemist or natural philosopher, one civil engineer, and two persons of other professions or occupations; all properly qualified for the office by their talents, their education, their experience, and their wisdom.

We recommend that a local Board of Health be appointed in every city and town, who shall be charged with the particular execution of the laws of the state, and the municipal ordinances and regulations, relating to public health, within their respective jurisdictions.

We recommend that local Boards of Health endeavor to carry into effect all their orders and regulations in a conciliatory manner; and that they resort to compulsory process only when the public good requires it.

We recommend that the successive enumerations of the inhabitants of the state be so made, abstracted, and published, that the most useful and desirable information concerning the population may be ascertained.

We recommend that the laws relating to the public registration of births, marriages, and deaths be perfected and carried into effect in every city and town of the state.

We recommend that, as far as practicable, there be used in all sanitary investigations and regulations, a uniform nomenclature for the causes of death, and for the causes of disease.

We recommend that the local Boards of Health provide for periodical house-to-house visitation, for the prevention of epidemic diseases, and for other sanitary purposes.

We recommend that measures be taken to ascertain the amount of sickness suffered in different localities; and among persons of different classes, professions, and occupations.

We recommend that the causes of consumption, and the circumstances under which it occurs, be made the subject of particular observation and investigation.

We recommend that nuisances endangering human life or health be prevented, destroyed, or mitigated.

We recommend that a sanitary association be formed in every city and town in the state, for the purpose of collecting and diffusing information relating to public and personal health.

We recommend that public bathing-houses and wash-houses be established in all cities and villages.

We recommend that, whenever practicable, the refuse and sewage of cities and towns be collected, and applied to the purposes of agriculture.

We recommend that local Boards of Health, and others, interested, endeavor to prevent the sale and use of unwholesome, spurious, and adulterated articles, dangerous to the public health, designed for food, drink, or medicine.

We recommend that institutions be formed to educate and qualify females to be nurses of the sick.

We recommend that persons be specially educated in sanitary science, as preventive advisers as well as curative advisers.

We recommend that parents, and others to whom the care of those in infancy

and childhood are entrusted, endeavor to understand and discharge their duties so that a good foundation may be laid for vigorous manhood and old age.

Reasons for Sanitary Survey

The sanitary reform we advocate is not like some of the popular reforms of the age. It rests upon no visionary theories, conceived alone in the closet, or by some impracticable enthusiast. It aims at the establishment of no abstract principle, with no definite, practical bearing or application. It is not radical in its character or tendency; does not seek to overturn nor upturn any social, political or religious sentiment or institution; nor abrogate any constitutional or statute law.

Every person in every station, can do something to promote this reform; and every such effort, wisely directed, will increase the amount of his own individual enjoyment, and add to the aggregate enjoyment of the people of the whole Commonwealth.

Massachusetts has always been eminent among the American states. Her metropolis has ever been the metropolis of New England. Her example has been imitated and her influence has been felt, wherever the sons of New England are found, or the name of New England is known.

She established in the United States the first system for the public registration of births, marriages, and deaths, by which the personal history and identity, and the sanitary condition of the inhabitants, may be ascertained. She founded the first Blind Asylum; the first State Reform School; and aided in founding the first Deaf and Dumb Asylum; and her money, public and private, has flowed freely in the support of all the noble charities and religious enterprises of the age.

One of her sons first introduced into the United States the remedy of vaccination for the prevention of smallpox, which has deprived that terrific disease of its power, whenever used, and rendered its approach generally harmless. Another of her sons has the honor of making the great discovery of etherization, by means of whose wonderful capabilities the surgeon's instrument is deprived of its sting, and labor of its sorrow; the operator is permitted to pursue his work undisturbed while the patient remains passive, unconscious, and unmoved by the horrors which, without it, might be inflicted.

On the pages of her history are recorded the noble deeds which have given her a good name and rendered her glorious. But her people demand at her hands a more full enjoyment of life, and a more abundant diffusion of its blessings; and no more noble and honorable and glorious page can anywhere be found, than that which shall record the adoption of some simple but efficient and comprehensive plan of Sanitary Reform; by which the greatest possible amount of physical power may be produced, the greatest possible amount of physical suffering may be prevented, and the greatest possible amount of physical, social, and moral enjoyment may be attained. "This is the true glory which outlives all other, and shines with undying lustre, from generation to generation, imparting to its works something of its own immortality."

All which is respectfully submitted.

Lemuel Shattuck,
N. P. Banks, Jr.,
Jehiel Abbott,
Commissioners.

Boston, April 25, 1850

APPENDIX II

CHRONOLOGICAL LIST OF DATES RELATING TO PUBLIC HEALTH IN MASSACHUSETTS

1630 Recording of births and deaths begun in Boston.

1721 Smallpox inoculation begun by Zabdiel Boylston.

1797 Law passed authorizing local boards of health.
Householder to notify local board of health of dangerous diseases: smallpox specifically mentioned.

1801 Benjamin Waterhouse introduced use of "Cowpox Vaccination."

1809 Law passed requiring appointment of Public Vaccinators.

1827 Doctors required to report dangerous diseases.

1837 Public Vaccinator law repealed.

1846 First Vital Statistics Report for Massachusetts.

1850 Report of the Sanitary Commission by Lemuel Shattuck.

1855 Compulsory smallpox vaccination law passed.

1869 Law enacted creating State Board of Health; Dr. Henry I. Bowditch named chairman.

1871 In the "Offensive Trade" Act to regulate slaughtering, the Board of Health received its first executive power.
Reports of prevalent causes of illness and death from selected correspondents.

1873 First Annual Report of Boston City Health Department.

1879 State Board of Health given general supervision of all streams and ponds.
State Board of Health merged into State Board of Health, Lunacy and Charity.

1880 Dr. Henry Pickering Walcott elected Health Officer of Board of Health, Lunacy and Charity.

1882 First Food and Drug Law passed.

1883 Smallpox made reportable to Board of Health.
Manual of Health Laws first compiled (revisions in 1886, 1893, 1915, 1922, 1929, 1938).
Four chemists and two inspectors appointed to begin food and drug work.
Chemical work done in private laboratories.

1884 Massachusetts Drainage Commission formed.
Diphtheria made reportable.

1886 State Board of Health reestablished as independent agency.
Department of Water Supply and Sewerage established by State Board.

1887 Lawrence Experiment Station created by the State Board of Health.

1888 Board recommends establishment of State vaccine laboratory.

1889 Influenza outbreak.

1890 Formation of Massachusetts Associated Boards of Health.
First Trickling Filter.

1891 Food and Drug Laboratory established by the Board.

1893 "Dangerous diseases" made reportable (list did not include tuberculosis).
Lawrence Water Filter.

1894 Board undertook production and free distribution of diphtheria antitoxin.
Completion of main part of North Metropolitan Sewerage System.
Bacteriologic diagnosis of diphtheria by Worcester Board of Health.

1895 Bacteriologic laboratory services begun by Dr. Theobald Smith at Antitoxin Laboratory.
Circular of information about tuberculosis issued by the Board.
Massachusetts Hospital for Consumptives and Tubercular Patients authorized.
Report on Metropolitan Water Supply Study.
School Inspection in Boston.

1896 The Vital Statistics of Massachusetts—a Forty-Year Summary—in annual report.

1897 Diagnostic Bacteriology service begun in laboratory at State House.

1898 First medical inspector appointed.
First State sanatorium for tuberculosis in the United States opened at Rutland.

1899 W. F. Whitney's study of cancer authorized by Board.

1901 Widal test made available to State.
Board given powers to regulate shellfish industry.

1903 Report on value and application of coliform tests as index of water pollution.
Vaccine lymph production and distribution authorized.

1904 New building completed for Antitoxin and Vaccine Laboratory.
Completion of main part of South Metropolitan Sewerage System, then the largest water supply reservoir in the country.

1905 Systematic dairy inspection begun.
Ophthalmia neonatorum made reportable.
Completion of Wachusett Reservoir of Metropolitan Water System, then the largest water supply reservoir in the country.

1906 Monthly Bulletin issued.

1907 State inspectors of health appointed.
Tuberculosis made reportable.
Polio report issued.

1909 Typhoid carriers first recognized.
North Reading State Sanatorium opened.

1910 Silver nitrate furnished for eyes of newborn.
Emergency pasteurization put into use.
Westfield and Lakeville State Sanatoria opened.

1911 Slaughtering inspection transferred to State Board of Health.
Outbreak of septic sore throat (1200 cases).
First activated sludge experiments.

1912 Special investigation of poliomyelitis; monograph issued.
Typhoid vaccine production begun.

1914 State Department of Health supersedes State Board.
Systematic dairy inspection ceased due to law transferring this work to local Boards of Health.

1915 Division of Hygiene began its educational projects, and child hygiene activities.
State Wassermann Laboratory opened.
Two public health nurses, called "educators," appointed.
Manufacture of arsphenamine begun by Food and Drug Division.

1917 Framingham demonstration of community tuberculosis control.
Pneumonia study; disease made reportable.
Production of pneumococcic serum, Types I and II.
"Health Instructor in Foods" appointed.
Antitoxin and Vaccine Laboratory granted Federal License #64 authorizing manufacture and interstate sale of biologic products.
Harvard Cancer Commission volunteered to diagnose specimens of tissue suspected of malignancy.
Child Conservation Committee appointed by Commissioner.

1918 Venereal diseases declared dangerous to the public health.
Manufacture and distribution of arsphenamine.
Nursing assistants to District Health Officers appointed.
Influenza outbreak.
First toxin-antitoxin made at Antitoxin and Vaccine Laboratory.
"Commonhealth" a quarterly journal of general health information issued.

1919 Name changed to Department of Public Health; tuberculosis sanatoria taken over; leper hospital taken over.
First supervisor and first health instructor in mouth hygiene.
Fiftieth Anniversary celebration interrupted by Boston police strike.
First state appropriation for prevention and control of cancer.

1920 Division of Tuberculosis and Sanatoria joins control and treatment measures.
Measures for protection of mothers and infants inaugurated.

1921 Cape Cod Health Bureau started.
Leper Colony transferred to Carville, Louisiana.
School Hygiene Consultant and School Nursing Consultant appointed.

1922 First venereal disease social worker employed.
First Department radio program (over Westinghouse, Springfield).
Research on role of public health in water purification and sewage treatment started.

1924 Chadwick Clinics begun for the detection of childhood tuberculosis.

1925 Cancer survey undertaken.
Lakeville Sanatorium converted to treatment of extra-pulmonary tuberculosis.
Investigation of extent of contamination of tidal waters and authority to prevent taking of shellfish from contaminated areas, granted.

1926 Extension investigation of summer camp sanitation.
State cancer program, including Pondville Hospital, authorized.

1927 Hinton test devised to supplant Wassermann.
Investigations of cross-connection by Engineering Bureau.

Pondville Hospital opened; six cancer clinics organized.
Production of influenza bacillus anti-serum begun.
Medical social workers added to cancer and tuberculosis services.

1928 First shellfish purification plant at Newburyport.
Lee septic sore throat epidemic, followed by increased use of pasteurized milk.
Boston passed regulation requiring pasteurization or certification of milk; the first in Massachusetts.

1929 Division of Hygiene changed to Division of Child Hygiene, and Division of Adult Hygiene created.
Three-year Chronic Disease Survey started.
Weekly Report of Communicable Diseases.

1931 Pneumonia Control Project begun with Commonwealth Fund.
Berkshire and Nashoba Health Districts formed under grant from Commonwealth Fund.

1933 First extensive investigation of outdoor bathing places.
Industrial Disease Survey.
Appendicitis campaign started.

1934 First assistant engineer assigned to District Health Office.
State Health Commission appointed by Governor (Report in 1936).
Distribution of immune globulin begun.
"Contact", for school physicians and superintendents, issued.

1936 Social Security expanded Child Health Services.
Convalescent infantile paralysis cases admitted to Lakeville.
First crippled children clinic center established.
First sanitary health officer assigned to health district.
Massachusetts Associated Boards of Health changed to Massachusetts Public Health Association.
"Newsletter", a monthly or bi-monthly budget of news, information and announcements for boards of health and others interested, issued.

1937 Division of Genitoinfectious Diseases established.
Hospitalization of arthritis cases begun.
Cancer section opened at Westfield State Sanatorium.

1938 Western branch of Food and Drug Division opened.
Department given power to adopt rules and regulations regarding the control of communicable diseases.

1939 Mosquito survey conducted.
Approval of bacteriological and serological laboratories begun.
Law passed requiring blood test during pregnancy.

1940 Examination of industrial employees for tuberculosis begun.

1941 Production of normal human serum albumin begun as war research.
Hospital licensing begun.
Nursing bureau established.
Completion of Quabbin Reservoir of Metropolitan Water System.
"Sanitalk" for water and sewage works operation issued.

1942 Dental Unit established (Bureau in 1944).
Laboratory for Biological Assay of Vitamins established in Food and Drug Division at Westfield.

Production of immune serum globulin begun as war research.
"Laboratory Notes" for those in Laboratory Approval Program issued.
"Department of Public Health News" (For staff members) issued.
"Nursing News" for public health nurses issued.
"Cancer Tidings" for Cooperative Cancer Committees issued.

1943 District organization completed; field workers assigned to District Offices.
Emergency Maternity and Infant Care Program begun.
"Cancer Bulletin", for physicians interested in Cancer, issued.

1944 Nutrition Bureau established.
Immune serum globulin made generally available.
Bureau of Health Information established.
Established Bureau of Sanitary Inspection.
Supervision of district health offices and Bureaus of Dental Health, Nursing, Nutrition, Sanitation and Social Service taken over by Supervisor of Local Health Administration.
Speech Therapy first included in Services for Crippled Children.
Weekly Report of Communicable Diseases enlarged to include text as well as morbidity statistics.

1945 Division of Local Health Administration officially established.
Blood Derivatives Program begun.

1946 Division of Dental Health established.
New building completed for blood derivatives program.

APPENDIX III

MEMBERS OF THE STATE BOARD OF HEALTH

Name	Occupation	Service Began	Service Ended
Henry I. Bowditch	Physician	1869	1879
George Derby	Physician	1869	1874*
P. Emory Aldrich	Lawyer	1869	1872
William C. Chapin	Manufacturer	1869	1871
Warren Sawyer	Business	1869	1873
Richard Frothingham	Historian	1869	1879
Robert T. Davis	Physician	1869	1879
G. V. Fox	Lawyer	1872	1873
John C. Hoadley	Civil Engineer	1874	1879
Thomas B. Newhall	Business	1874	1879
David L. Webster	Manufacturer	1874	1879
Charles F. Folsom	Physician	1874	1879

MEMBERS OF THE STATE BOARD OF HEALTH, LUNACY AND CHARITY, COMMITTEE ON HEALTH

Name	Occupation	Service Began	Service Ended
Henry I. Bowditch	Physician	1879	1880
Robert T. Davis	Physician	1879	1884
John C. Hoadley	Civil Engineer	1879	1882
Alfred Hosmer	Physician	1881	1882
Thomas Talbot	Lawyer	1880	1884
George P. Carter	Business	1880	1883
Henry P. Walcott	Physician	1882	1883
John Fallon	Business	1882	1886
Edgar E. Dean	Physician	1883	1885
Charles E. Donnelly	Lawyer	1883	1886
Reuben Noble	Business	1883	1885
Samuel A. Green	Physician	1885	1886
Edward Hitchcock	Physician	1884	1886

MEMBERS OF THE STATE BOARD OF HEALTH

Name	Occupation	Service Began	Service Ended
Henry P. Walcott	Physician	1886	1914
Hiram F. Mills	Civil Engineer	1886	1914
Julius H. Appleton	Manufacturer	1886	1890
Frank W. Draper	Physician	1886	1901
Thornton K. Lothrop	Lawyer	1886	1890
Elisha M. Jones	Physician	1886	1893
James White	Business	1886	1887
Theodore C. Bates	Manufacturer	1887	1888
Joseph W. Hastings	Physician	1889	1894
John M. Raymond	Lawyer	1890	1892
Gen. Morris Schaff	Soldier	1891	1892

* Service terminated by death

James W. Hull	Insurance	1893	1911
Gerard C. Tobey	Lawyer	1893	1911
Charles H. Porter	Insurance	1893	1911
Julian A. Mead	Physician	1895	1914
John W. Bartol	Physician	1902	1907
Robert W. Lovett	Physician	1907	1914
Clement F. Coogan	Business	1911	1914
Joseph A. Plouff	Lawyer	1911	1914
C. E. McGillicuddy	Lawyer	1911	1914
Milton J. Rosenau	Hygienist	1913	1914

COMMISSIONERS

Name	Year of Appointment	Year of Ending Service (as Com.)
Allan J. McLaughlin, M.D.	1914	1918
Eugene R. Kelley, M.D.	1918	1925*
George H. Bigelow, M.D.	1925	1933
Henry D. Chadwick, M.D.	1933	1938
Paul J. Jakmauh, M.D.	1938	1943
Vlado A. Getting, M.D. Dr. P.H.	1943	——

MEMBERS OF THE PUBLIC HEALTH COUNCIL

1914-1944

Name	City or Town	Occupation	Service Began	Service Ended
William T. Sedgwick	Boston	Biologist	1914	1921
George C. Whipple	Cambridge	Sanitary Eng.	1914	1923
Milton J. Rosenau	Brookline	Hygienist	1914	1915
William J. Gallivan	Boston	Physician	1914	1919
David L. Edsall	Boston	Physician	1914	1921
Joseph E. Lamoureux	Lowell	Physician	1914	1924
John T. Wheelwright	Boston	Lawyer	1915	1919
Warren C. Jewett	Worcester	Retired	1919	1925
Sylvester E. Ryan	Springfield	Physician	1920	1937
Roger I. Lee	Boston	Physician	1921	1934
Richard P. Strong	Boston	Physician	1921	1943
James L. Tighe	Holyoke	Engineer	1923	——
Francis H. Lally	Milford	Physician	1924	——
Gordon Hutchins	Concord	Engineer	(1926	1937
			(1940	——
Richard M. Smith	Boston	Physician	1934	——
Charles F. Lynch	Springfield	Physician	1937	1940
George D. Dalton	Wollaston	Physician	1937	1940
R. Nelson Hatt	Springfield	Physician	1940	1942
Cecil K. Drinker	Brookline	Physician	1943	1946
Elmer S. Bagnall	Groveland	Physician	1943	1945
George L. Schadt	Springfield	Physician	1942	1943
William H. Griffin	Boston	Dentist	1945	——
Charles F. Wilinsky	Boston	Physician	1946	——

* Service terminated by death

DIVISION DIRECTORS

1915-1946

Division	Director	Began Service	Ended Service
Communicable Disease	Eugene R. Kelley, M.D.	1915	1918
	John S. Hitchcock, M.D.	1918	1919
	Bernard W. Carey, M.D.	1919	1923
	George H. Bigelow, M. D.	1924	1925
	Wolfert G. Webber, M.D. (Acting Director)	1925	1926
	Clarence L. Scamman, M.D.	1926	1931
	Gaylord W. Anderson, M.D.	1931	1937
	Roy F. Feemster, M.D.	1937	1945
	Merrill E. Champion, M.D. (Acting Director)	1945	1946
	Roy F. Feemster, M.D.	1946	——
Sanitary Engineering	Xanthus H. Goodnough, C.E.	1895	1930
	Arthur D. Weston, C.E.	1930	——
Division of Water & Sewage (Incorporated into Division of Sanitary Engineering in 1933)	Harry W. Clark	1915	1933
Food and Drugs	Hermann C. Lythgoe	1915	1946
	Carl S. Ferguson	1946	——
Hygiene	Selskar M. Gunn, C.P.H.	1915	1916
	Lyman A. Jones, M.D.	1916	1918
	Merrill E. Champion, M.D.	1918	1928
Maternal & Child Health	M. Luise Diez, M.D.	1929	1942*
	Florence L. McKay, M.D.	1942	——
Cancer & Other Chronic Diseases	Herbert L. Lombard, M.D.	1929	——
Biologic Laboratories	Milton J. Rosenau, M.D.	1915	1920
	Benjamin White, Ph.D.	1920	1933
	Elliott S. Robinson, M.D.	1933**	1942
	Geoffrey Edsall, M.D.	1942***	——
Tuberculosis & Sanatoria	William J. Gallivan, M.D.	1920	1921
	Sumner H. Remick, M.D.	1921	1925
	Henry D. Chadwick, M.D. (Acting Director)	1926	1927
	Sumner H. Remick, M.D.	1927	1929
	Alton S. Pope, M.D.	1930	——
Venereal Diseases	Nels A. Nelson, M.D.	1937	1941
	Ernest B. Howard, M.D.	1941**	1942
	John B. Hozier, M.D.	1942***	1944
	Harry G. Wyer, M.D.	1944***	1944
	George E. Perkins, M.D.	1944***	——

DIVISION DIRECTORS (continued)

1915-1946

Local Health Administration	Roy F. Feemster, M.D. (Acting Director)	1945***	1946
	John J. Poutas, M.D.	1946	1946
	Robert E. Archibald, M.D.	1946	——
Dental Health	A. Lawrence Corbman, D.D.S. (Acting Director)	1946	——

* Service terminated by death
** Military Leave
*** Military substitute

STATE DISTRICT HEALTH OFFICERS

Name	Year of Appointment	Year of Ending Service (as D.H.O.)
Frank L. Morse, M.D.	1915	1915
William H. Coon, M.D.	1915	1915
Lewis Fish, M.D.	1915	1916
Lyman A. Jones, M.D.	(1915	(1916
	(1918	(1927
William W. Walcott, M.D.	1915	1917*
Merrill E. Champion, M.D.	1915	1918
John S. Hitchcock, M.D.	1915	1918
Adam S. MacKnight, M.D.	1915	1918
Charles E. Simpson, M.D.	1915	1925*
Stanley H. Osborn, M.D.	1916	1917
Arthur A. Brown, M.D.	1916	1919
Francis E. Finnegan, M.D.	1916	1922*
Howard A. Streeter, M.D.	1917	1919
George T. O'Donnell	1917	1927
Russell B. Sprague, M.D.	1918	1919
Charles W. Milliken, M.D.	1918	1924
James W. Keenan, M.D.	1919	1920
Bertrand E. Roberts, M.D.	1919	1920
Oscar A. Dudley, M.D.	1919	1944*
Harold E. Miner, M.D.	1920	1936*
Leland M. French, M.D.	1922	1929
Richard P. MacKnight, M.D.	1924	1938
Edward A. Lane, M.D.	1927	1929
George M. Sullivan, M.D.	(1927	1929
	(1934	1935
Wilson W. Knowlton, M.D.	1929	1930
Charles B. Mack, M.D.	1920	1937*
Frederick S. Leeder, M.D.	1930	1931
Robert E. Archibald, M.D.	1930	1946
Walter W. Lee, M.D.	1931	——
Henry M. DeWolfe, M.D.	1935	1943*
John J. Poutas, M.D.	1936	1940
Harold W. Stevens, M.D.	1936	——
Charles E. Gill, M.D.	1937	1939
	1940	1942**
	1946	——
Frank B. Carroll, M.D.	1938	1941
Ernest M. Morris, M.D.	1940	1940
Vlado A. Getting, M.D.	1941	1942
Morris Taylor, M.D.	1941***	1942
Nicholas Fiumara, M.D.	(1942***	1943**
	(1946	——
A. Daniel Rubenstein, M.D.	1942	——

* Service terminated by death

STATE DISTRICT HEALTH OFFICERS (continued)

Name	Year of Appointment	Year of Ending Service (as D.H.O.)
Arthur E. Burke, M.D.	1943***	——
Harry G. Wyer, M.D.	1944***	1946
James W. Knepp, M.D.	1945***	1946
Robert E. Ober, M.D.	1946	——
Walter J. Pennell, M.D.	1946	——
Paul Richmond, Jr., M.D.	1946	——

* Service terminated by death
** Military Leave
*** Military substitute

SUPERINTENDENTS OF SANATORIA

1920-1944

	Service Began	Service Ended
Rutland		
Ernest B. Emerson, M.D.	1920	1944
Paul Dufault, M.D.	1944	——
Lakeville		
Sumner Coolidge, M.D.	1920	1924
Leon A. Alley, M.D.	(1924	1941**
	(1945	——
Claire W. Twinam, M.D.	1941***	1943
Arthur Kanserstein, M.D.	1943***	1943
Donald A. Martin, M.D.	1943***	1945
North Reading		
Carl C. MacCorison, M.D.	1920	1944
Claire W. Twinam, M.D.	1944	——
Westfield		
Henry D. Chadwick, M.D.	1920	1929
Roy Morgan, M.D.	1929	1946
Donald A. Martin, M.D.	1946	——
Pondville—established in 1927		
Lyman Asa Jones, M.D.	1927	1929
George M. Sullivan, M.D.	1929	1934
George L. Parker, M.D.	1934	——

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